OPEN ACCESS

ISSN (Print) 2412-3277

December 2020 Volume 6 Number 2

JMMC

Journal of Monno Medical College

An Official Journal of Monno Medical College, Manikganj, Bangladesh

JOURNAL OF MONNO MEDICAL COLLEGE

December 2020 | Volume 6 | Number 2

ISSN (Print) 2412-3277

Journal of Monno Medical College (J Monno Med Coll) is a leading, open access, peer-reviewed scientific journal on medical science for rapid publication of articles published by Monno Medical College, Monno City, Gilondo, Manikgonj Bangladesh. This journal provides quick initial decisions followed by a high quality medical editing service and an excellent publishing service to its authors. This journal has been launched from June 2015 and will be continued. **J Monno Med Coll** is published 2 times per year. This journal aims to publish scientifically written, evidence-based articles from all disciplines of medical sciences and clinical practice, preventive medicine, epidemiology as well as healthcare research. There are a great scope to publish the different kinds of articles including original research papers, reviews of the specific topics, case report and short research communications. Submissions of basic and clinical research are both considered. Manuscripts should present novel findings addressing significant questions in clinical medicine research and practice, in the form of original research article, editorial, review article, short communication, case report, letter to the editor, and others. In addition to that **J Monno Med Coll** publishes studies performed by multi-center groups in the various disciplines of medicine, including clinical trials and cohort studies from large patient populations, specifically phase I, phase II, and phase III studies performed under the auspices of groups such as general clinical research centers, cooperative oncology groups, and the like. Reports of patients with common presentations or diseases, especially studies that delineate the natural history and therapy of important conditions are also published. Reviews oriented to the practicing internist and diagnostic puzzles, complete with images from a variety of specialties are also published. Careful physiological or pharmacological studies that explain normal function or the body's response to disease as well as analytic reviews such as meta-analyses and decision analyses using a formal structure to summarize an important field are acceptable to publish.

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Email: editor.jmmc@yahoo.com
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ISSN (Print) 2412-3277

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Instructions to Author(s)

Submission of manuscript:

- Authors should submit electronic version (Microsoft word doc) of the manuscript to the editor via e-mail **(editor.jmmc@yahoo.com)** and two hard copies of manuscript with cover letter signed by all authors of the paper
- Accepted papers will be acknowledged and processed further; if the papers are rejected, the decision will be communicated to the corresponding author but the manuscripts will not be returned.
- Acceptance or rejection of the manuscript would be decided after peer review/the decision of editorial team.
- Acceptance or rejection of the manuscript for publication in journal would be informed to corresponding author within 72 working hours from the time of submission

Preparing a Manuscript:

- Authors should keep their manuscripts as short as they reasonably can (the total number of words should not exceed 7500).
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- The language of manuscript must be simple and explicit.
- Author's/Co-author's name or any other identification should not appear anywhere in the body of the manuscript to facilitate blind review.

Types of Manuscript

The following categories of manuscript are accepted for this journal:

a. Original Research Articles
b. Systematic Review or Meta Analysis
c. Review Article
d. Short communications
e. Case reports
f. Letter to Editor

Reporting guidelines

The guidelines listed below should be followed where appropriate. Please use these guidelines to structure your article. Completed applicable checklists, structured abstracts and flow diagrams should be uploaded with your submission; these will be published alongside the final version of your paper.

- CONSORT Statement (http://www.consort-statement.org/) for reporting of randomised controlled trials: please use the appropriate extension to the CONSORT statement, including the extension for writing abstracts
- STARD (www.stard-statement.org/) for reporting of diagnostic accuracy studies)
- STROBE (http://www.strobe-statement.org/) for reporting of observational studies in epidemiology

a) Checklist for cohort, case-control, and cross-sectional studies (combined)
b) Checklist for cohort studies
c) Checklist for case-control studies
d) Checklist for cross-sectional studies

- PRISMA (www.prisma-statement.org/index.htm) for reporting of systematic reviews
- MOOSE for reporting of meta-analyses of observational studies
- STREGA (www.medicine.uottawa.ca/public-health-genomics/web/eng/strega.html) for reporting of gene-disease association studies.
- The Equator Network (Enhancing the Quality and Transparency Of health Research) provides a comprehensive list of reporting guidelines. The web site of it is http://www.equator-network.org/resource-centre/library of-health-research -reporting/library/

Original Research Articles:

It should be arranged into the following sections:

1. Title
2. Author(s)
3. Address

4. Structured Abstract
5. Key words
6. Introduction
7. Methodology
8. Results
9. Discussion
10. Conclusion
11. Acknowledgement
12. References
13. Tables
14. Figures

Title page

It should be paginated as page 1 of the paper. It should carry the title, authors' names and their affiliations, running title, address for correspondence including Email address & mobile number.

Title

Must be informative, specific and short and not exceed 100 words.

Authors and affiliations

The names of authors and their appropriate addresses should be given. It should be made clear which address relates to which author.

Running title

It is a short title typed in the journal at the right top corner of right hand page of the article (except the lead page). A short running title of not more than 40 characters should be given.

Address for correspondence

The corresponding author's contact address should be given in the title page. The fax number (if available) may be mentioned. The Email ID and mobile number of the corresponding author or the contact Email ID must also be provided.

Abstract and key words

Abstract: It must start on a new page carrying the following information: (a) Title (without authors names or affiliations), (b) Abstract body, (c) Key words, (d) Running title. It should not exceed 350 words excluding the title and the key words. The abstract must be concise, clear and informative rather than indicative. New and important aspects must be emphasized. The abstract must be in a structured form consisting of background, objectives, methodology, result and conclusion briefly explaining what was intended, done, observed and concluded. Authors should state the main conclusions clearly and not in vague statements. The conclusions and recommendations not found in the text of the article should not be given in the abstract.

Key words: A list of 3-7 keywords should be provided which will help readers or indexing agencies in cross-indexing the study. The words found in title may be given as key words. All keywords should be provided according to MeSH terms at: http://www.nlm.nih.gov/mesh/MBrowser.html. Note that the preferred expression is indicated by the label "MeSH Heading" and not "Entry Term." The desired terms may then be copied from the MeSH Browser. Another way of finding appropriate headings is to search PubMed to find articles on similar topics, and review the MeSH headings assigned to those articles.

Introduction

It should start on a new page. Essentially this section must introduce the subject and briefly say how the idea for research originated. Give a concise background of the study. Do not review literature extensively but provide the most recent work that has a direct bearing on the subject. Justification for research aims and objectives must be clearly mentioned without any ambiguity. The purpose of the study should be stated at the end. It should not exceed 500 words.

Methodology

This section should deal with the materials used and the methodology - how the work was carried out. The procedure adopted should be described in sufficient detail to allow the study to be interpreted and repeated by the readers, if necessary. The number of subjects, the number of groups studied, the study design, sources of drugs with dosage regimen or instruments used, statistical methods and ethical aspects must be mentioned under the section in text format not in structured format. The methodology- the data collection procedure - must be described in sufficient detail. If a procedure is a commonly used one, giving a reference (previously published) would suffice. If a method is not well known (though previously published) it is better to describe it briefly. Give explicit descriptions of modifications or new methods so that the readers can judge their accuracy, reproducibility and reliability. The nomenclature, the source of material and equipment used, with details of the manufacturers in parentheses, should be clearly mentioned. Drugs and chemicals should be precisely identified using their non-proprietary names or generic names. If necessary, the proprietary or commercial name may be inserted once in parentheses. In case of pharmaceuticals, the first letter of the drug name should be small for generic name (e.g., dipyridamole, propranolol) but capitalized for proprietary names (e.g., Persantin, Inderal). The routes of administration may be abbreviated, e.g., intraarterial (i.a.), intracerebroventricular (i.c.v.), intra-gastric lavage (i.g.), intramuscular (i.m.), intraperitoneal (i.p.), intravenous (i.v.), per os (p.o.), subcutaneous (s.c.), transdermal (t.d.).

Statistical Methods

The details of statistical tests used and the level of significance should be stated. If more than one test is used it is important to indicate which groups and parameters have been subjected to which test.

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The results should be stated concisely without comments. It should be presented in logical sequence in the text with appropriate reference to tables and/or figures. The data given in tables or figures should not be repeated in the text. The same data should not be presented in both tabular and graphic forms. Simple data may be given in the text itself instead of figures or tables. Avoid discussions and conclusions in the results section.

Discussion

This section should deal with the interpretation, rather than recapitulation of results. It is important to discuss the new and significant observations in the light of previous work. Discuss also the weaknesses or pitfalls in the study. New hypotheses or recommendations can be put forth. Avoid unqualified statements and conclusions not completely supported by the data. Repetition of information given under Introduction and Results should be avoided.

Conclusion

Conclusions must be drawn considering the strengths and weaknesses of the study. They must be conveyed in the last paragraph under Discussion. Make sure conclusions drawn should tally with the objectives stated under Introduction.

Acknowledgements

It should be typed in a new page. Acknowledge only persons who have contributed to the scientific content or provided technical support. Sources of financial support should be mentioned.

References

It should begin on a new page. Avoid citing abstracts as references. Papers which have been submitted and accepted but not yet published may be included in the list of references with the name of the journal and indicated as “In press”. A photocopy of the acceptance letter should be submitted with the manuscript. Information from manuscript “submitted” but “not yet accepted” should not be included. Avoid using abstracts as references. The “unpublished observations” and “personal communications” may not be used as references but may be inserted (in parentheses) in the text. References are to be cited in the text by superscripted number and should be in the order in which they appear. References cited only in tables or in legends to figures should be numbered in accordance with a sequence established by the first identification in the text of the particular table or illustration. The references must be verified by the author(s) against the original documents. The list of references should be typed double spaced following the Vancouver style. Examples are given below.

Tables

The number of table should be 3 or 4 in number. Each table must be self-explanatory and presented in such a way that they are easily understandable without referring to the text. It should be typed with double spacing and numbered consecutively with Arabic numerals. Provide a short descriptive caption above each table with foot notes and/or explanations underneath. The number of observations, subjects and the units of numerical figures must be given. It is also important to mention whether the given values are mean, median, mean±SD or mean±SEM. All significant results must be indicated using asterisks. Appropriate positions for the tables within the text may be indicated.

Check list for Table

- Units of data given?
- "n"mentioned?
- Mean ± SD or Mean ± SEM given?
- Statistical significance of groups indicated by asterisks or other markers?
- P values given?
- Rows and columns properly aligned?
- Appropriate position in the text indicated?

Figures

Each figure must be numbered and a short descriptive caption must be provided. All significant results should be indicated using asterisks. For graphs and flow charts, it is not necessary to submit the photographs. A manually prepared or computer drawn figure (with good contrast) on a good quality paper is acceptable. Identify each figure/diagrams on the back with a typed label which shows the number of the figure, the name of
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Check list for Figure

- Serially numbered?
- Self explanatory caption given?
- X and Y axes graduated?
- X and Y axes titled (legend)?
- Units mentioned (if necessary)?
- Different symbols/markers for different groups given?
- SD or SEM represented (graphically)?
- Statistical significance indicated?
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Systematic Review or Meta Analysis

Authors should report systematic reviews and meta-analyses in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement. For Systematic Reviews, both abstract and text of the manuscript should be subdivided into the following sequential sections:

1) Context: Provide a sentence or two explaining the importance of the review question.

2) Objective: State the precise primary objective of the review. Indicate whether the review emphasizes factors such as cause, diagnosis, prognosis, therapy, or prevention and include information about the specific population, intervention, exposure, and tests or outcomes that are being reviewed.

3) Data Sources: Succinctly summarize data sources, including years searched. Include in the search the most current information possible, ideally conducting the search several months before the date of manuscript submission. Potential sources include computerized databases and published indexes, registries, abstract booklets, conference proceedings, references identified from bibliographies of pertinent articles and books, experts or research institutions active in the field, and companies or manufacturers of tests or agents being reviewed. If a bibliographic database is used, state the exact indexing terms

used for article retrieval, including any constraints (for example, English language or human subjects). If abstract space does not permit this level of detail, summarize sources in the abstract including databases and years searched, and place the remainder of the information in the "Methods" section of the text.

4) Study Selection: Describe inclusion and exclusion criteria used to select studies for detailed review from among studies identified as relevant to the topic. Under details of selection include particular populations, interventions, outcomes, or methodological designs. Specify the method used to apply these criteria (for example, blinded review, consensus, multiple reviewers). State the proportion of initially identified studies that met selection criteria.

5) Data Extraction: Describe guidelines used for abstracting data and assessing data quality and validity (such as criteria for causal inference). State the method by which the guidelines were applied (eg, independent extraction by multiple observers).

6) Results: State the main results of the review, whether qualitative or quantitative, and outline the methods used to obtain these results. For meta-analyses, state the major outcomes that were pooled and include odds ratios or effect sizes and, if possible, sensitivity analyses. Accompany numerical results by confidence intervals, if applicable, and exact levels of statistical significance. For evaluations of screening and diagnostic tests, include sensitivity, specificity, likelihood ratios, receiver operating characteristic curves, and predictive values. For assessments of prognosis, summarize survival characteristics and related variables. State the major identified sources of variation between studies, including differences in treatment protocols, protocols, co-interventions, confounders, outcome measures, length of follow-up, and dropout rates.

7) Conclusions: Clearly state the conclusions and their applications (clinical or otherwise), limiting interpretation to the domain of the review.

Systematic reviews are welcome. They should be critical assessments of current evidence covering a broad range of topics of concern to those working in the specific field of journal. Systematic reviews should be 4000-5000 words (abstracts to be structured as above).

N.B.: For advice on writing systematic reviews consult: **The Cochrane Reviewers' Handbook Meta-analysis of RCT:** A MOOSE checklist is required for meta-analysis of RCT.

Review articles:

These should contain title page, abstract (need not be structured) and key words. The text proper should be written under appropriate sub-headings. The total number of text words should not exceed 10000 and the total number of figures and tables should not be more than 7.

Short communications:

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- Name, address, telephone and fax numbers and e-mail address of corresponding author
- Running title

- Number of pages, number of figures and number of tables.
- Abstract- in structured (not in Review article, case report, short communication) form along with title, key words and running title.
- Article (double spaced)
- Acknowledgements (separate sheet)
- References (Vancouver Style)
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- Figures/photographs and legends
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- Ethical committee clearance certificate (as and whenever applicable)

Examples of References - Vancouver Style

From Uniform Requirements for Manuscripts, www.icmje.org

Articles in Journals

1. Standard journal article

List the first six authors followed by et al. (Note: NLM now lists up through 25 authors; if there are more than 25 authors, NLM lists the first 24, then the last author, then et al.)

Vega KJ, Pina I, Krevsky B. Heart transplantation is associated with an increased risk for pancreatobiliary disease. Ann Intern Med 1996 Jun 1;124(11):980-3

As an option, if a journal carries continuous pagination throughout a volume (as many medical journals do) the month and issue number may be omitted. (Note: For consistency, the option is used throughout the examples in Uniform Requirements. NLM does not use the option.)

Vega KJ, Pina I, Krevsky B. Heart transplantation is associated with an increased risk for pancreatobiliary disease. Ann Intern Med 1996;124: 980-3

More than six authors:

Parkin DM, Clayton D, Black RJ, Masuyer E, Friedl HP, Ivanov E, et al. Childhood leukaemia in Europe after Chernobyl: 5 year follow-up. Br J Cancer 1996;73:1006-12

2. Organization as author

The Cardiac Society of Australia and New Zealand. Clinical exercise stress testing. Safety and performance guidelines. Med J Aust 1996; 164: 282-4

3. No author given

Anonymous. Cancer in South Africa [editorial]. S Afr Med J 1994;84:15

4. Article not in English

(Note: NLM translates the title to English, encloses the translation in square brackets, and adds an abbreviated language designator.)

Ryder TE, Haukeland EA, Solhaug JH. Bilateral infrapatellar seneruptur hostidligere frisk kvinne. Tidsskr Nor Laegeforen 1996;116:41-2.

5. Volume with supplement

Shen HM, Zhang QF. Risk assessment of nickel carcinogenicity and occupational lung cancer. Environ Health Perspect 1994;102 Suppl 1:275-82.

6. Issue with supplement

Payne DK, Sullivan MD, Massie MJ. Women's psychological reactions to breast cancer. Semin Oncol 1996; 23(1 Suppl 2):89-97.

7. Volume with part

Ozben T, Nacitarhan S, Tuncer N. Plasma and urine sialic acid in non-insulin dependent diabetes mellitus. Ann Clin Biochem 1995;32(Pt 3):303-6.

8. Issue with part

Poole GH, Mills SM. One hundred consecutive cases of flap lacerations of the leg in ageing patients. N Z Med J 1994;107(986 Pt 1):377-8.

9. Issue with no volume

Turan I, Wredmark T, Fellander-Tsai L. Arthroscopic ankle arthrodesis in rheumatoid arthritis. Clin Orthop

1995;(320):110-4.

10. No issue or volume

Browell DA, Lennard TW. Immuno-logic status of the cancer patient and the effects of blood transfusion on antitumor responses. Curr Opin Gen Surg 1993:325-33.

11. Pagination in Roman numerals

Fisher GA, Sikic BI. Drug resistance in clinical oncology and hematology. Introduction. Hematol Oncol Clin North Am 1995 Apr;9(2):xi-xii.

12. Type of article indicated as needed

Enzensberger W, Fischer PA. Metronome in Parkinson's disease [letter]. Lancet 1996;347:1337.

Clement J, De Bock R. Hematological complications of hantavirus nephro-pathy (HVN) [abstract]. Kidney Int 1992;42:1285.

13. Article containing retraction

Garey CE, Schwarzman AL, Rise ML, Seyfried TN. Ceruloplasmin gene defect associated with epilepsy in EL mice [retraction of Garey CE, Schwarzman AL, Rise ML, Seyfried TN. In: Nat Genet 1994;6:426-31]. Nat Genet 1995;11:104.

14. Article retracted

Liou GI, Wang M, Matragoon S. Precocious IRBP gene expression during mouse development [retracted in Invest Ophthalmol Vis Sci 1994; 35:3127]. Invest Ophthalmol Vis Sci 1994;35:1083-8.

15. Article with published erratum

Hamlin JA, Kahn AM. Herniography in symptomatic patients following inguinal hernia repair [published erratum appears in West J Med 1995;162:278]. West J Med 1995;162: 28-31. Books and Other Monographs

(Note: Previous Vancouver style incorrectly had a comma rather than a semicolon between the publisher and the date.)

16. Personal author(s)

Ringsven MK, Bond D. Gerontology and leadership skills for nurses. 2nd ed. Albany (NY): Delmar Publishers; 1996.

17. Editor(s), compiler(s) as author

Norman IJ, Redfern SJ, editors. Mental health care for elderly people. New York: Churchill Livingstone; 1996.

18. Organization as author and publisher

Institute of Medicine (US). Looking at the future of the Medicaid program. Washington: The Institute; 1992.

19. Chapter in a book

Phillips SJ, Whisnant JP. Hypertension and stroke. In: Laragh JH, Brenner BM, editors. Hypertension: Pathophysiology, diagnosis, and management. 2nd ed. New York: Raven Press; 1995. p. 465-78.

20. Conference proceedings

Kimura J, Shibasaki H, editors. Recent advances in clinical neuro-physiology. Proceedings of the 10th International Congress of EMG and Clinical Neurophysiology; 1995 Oct 15-19; Kyoto, Japan. Amsterdam: Elsevier; 1996.

21. Conference paper

Bengtsson S, Solheim BG. Enforce-ment of data protection, privacy and security in medical informatics. In: Lun KC, Degoulet P, Piemme TE, Rienhoff O, editors. MEDINFO 92. Proceedings of the 7th World Congress on Medical Infor-matics; 1992 Sep 6-10; Geneva, Switzerland. Amsterdam: North-Holland; 1992. p. 1561-5

22. Scientific or technical report

Issued by funding/sponsoring agency:

Smith P, Golladay K. Payment for durable medical equipment billed during skilled nursing facility stays. Final report. Dallas (TX): Dept. of Health and Human Services (US), Office of Evaluation and Inspections; 1994 Oct. Report No.: HHSI-GOEI69200860.

Issued by performing agency:

Field MJ, Tranquada RE, Feasley JC, editors. Health services research: work force and educational issues. Washington: National Academy Press; 1995. Contract No.: AHCPR282942008. Sponsored by the Agency for Health Care Policy and Research.

23. Dissertation/Thesis

Kaplan SJ. Post-hospital home health care: the elderly's access and utilization [Dissertation/Thesis]. St. Louis (MO): Washington Univ.; 1995.

24. Patent

Larsen CE, Trip R, Johnson CR, in-ventors; Novoste Corporation, assignee. Methods for procedures re-lated to the electro-

physiology of the heart. US patent 5,529,067. 1995 Jun 25.

Other Published Material

25. Newspaper article

Lee G. Hospitalizations tied to ozone pollution: study estimates 50,000 admissions annually. The Washington Post 1996 Jun 21;Sect. A:3 (col. 5).

26. Audiovisual material

HIV+/AIDS: the facts and the future [videocassette]. St. Louis (MO): Mosby-Year Book; 1995.

27. Legal material

Public law: Preventive Health Amendments of 1993, Pub. L. No. 103-183, 107 Stat. 2226 (Dec. 14, 1993). Unenacted bill: Medical Records Confidentiality Act of 1995, S. 1360, 104th Cong., 1st Sess. (1995)

Code of Federal Regulations: Informed Consent, 42 C.F.R. Sect. 441.257 (1995).

Hearing: Increased Drug Abuse: the Impact on the Nation's Emergency, Rooms: Hearings Before the Subcomm. On Human Resources and Intergovernmental Relations of the House Comm. On Government Operations, 103rd Cong., 1st Sess. (May 26, 1993).

28. Map

North Carolina. Tuberculosis rates per 100,000 population, 1990 [demo-graphic map]. Raleigh: North Carolina Dept. of Environment, Health, and Natural Resources, Div. of Epidemiology; 1991.

29. Dictionary and similar references

Stedman's medical dictionary. 26th ed. Baltimore: Williams & Wilkins; 1995. Apraxia; p. 119-20.

30. Classical material

The Winter's Tale: act 5, scene 1, lines 13-16. The complete works of William Shakespeare. London: Rex; 1973.

31. In press

(Note: NLM prefers "forthcoming" because not all items will be printed.)

Leshner AI. Molecular mechanisms of cocaine addiction. N Engl J Med. In press 1996.

Electronic Material

32. Journal article in electronic format

Morse SS. Factors in the emergence of infectious diseases. Emerg Infect Dis [serial online] 1995 Jan-Mar [cited 1996 Jun 5];1(1):[24 screens].

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Monno City, Gilondo, Manikgonj, Bangladesh
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Checklist (to be tick marked, as applicable and one copy attached with the manuscript)

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Covering letter

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- ❑ Conflicts of interest disclosed

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- ❑ Abstract provided (not more than 350 words for case reports and 350 words for original articles)
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Editorial
Journal of Monno Medical College,
December 2020, Vol. 6, No. 2, pp. 28-29 ISSN (Print) 2412-3277

Antibiotic Resistant a Global Public Health Concern

Ali KM

Antibiotic resistance is the ability of bacteria or other microbes to resist the effects of an antibiotic. Antibiotic resistance occurs when bacteria change in some way that reduces or eliminates the effectiveness of drugs, chemicals, or other agents designed to cure or prevent infections. The bacteria survive and continue to multiply causing more harm. Antibiotic resistant does not mean the body is becoming resistant to antibiotics, it is that bacteria have become resistant to antibiotics designed to kill them. It has been estimated that at least one half of antibiotic use in the developed world--and perhaps more in the developing world--is inappropriate. Antibiotic resistance has been called one of the world's most pressing public health problems. Almost every type of bacteria has become stronger and less responsive to antibiotic treatment when it is really needed. These antibiotic-resistant bacteria can quickly spread to family members, schoolmates, and co-workers - threatening the community with a new strain of infectious disease that is more difficult to cure and more expensive to treat.

Antibiotic use promotes development of antibiotic-resistant bacteria. Every time a person takes antibiotics, sensitive bacteria are killed, but resistant germs may be left to grow and multiply. Repeated and improper uses of antibiotics are primary causes of the increase in drug-resistant bacteria.

Now-a-days, about 70 percent of the bacteria that cause infections in hospitals are resistant to at least one of the drugs most commonly used for treatment. Some organisms are resistant to all approved antibiotics and can only be treated with experimental and potentially toxic drugs. Infection caused by antibiotic resistant germs is difficult and sometimes impossible to treat. During the late 1950s and early 1960s, antibiotic resistance to multiple antimicrobial agents was detected, for the very first time, among enteric bacteria namely Salmonella, Shigella, and Escherichia coli. These resistant strains caused huge clinical, economic losses and loss of life, mainly in the developing world.

Antibiotic resistant causes over estimated 700000 deaths annually worldwide and every country are potentially affected. If not properly addressed the number could grow to 10 million per year by 2050. In the USA alone, antibiotic-resistant pathogen-associated hospital-acquired infections (HAIs) cause 99,000 deaths annually. In 2006, about 50,000 Americans died due to two common HAIs, namely pneumonia and sepsis, costing about $8 billion to the US economy. In Bangladesh exact data on antibiotic resistant is not available, but various study shows that the situation is alarming like other developing countries.

Patients with antibiotic-resistant bacterial infections need to stay in the hospital for at least 13 days. In most cases antibiotic resistant infections requires extended hospital stay, additional follow up doctor visit, and costly and toxic alternatives. WHO's new Global Antimicrobial Surveillance System (GLASS) reveals widespread occurrence of antibiotic resistance among 500 000 people with suspected bacterial infections across 22 countries.

Since their discovery more than 70 years ago, antibacterial drugs have become an essential part of the modern healthcare landscape, allowing treatment of previously life-threatening bacterial infections. However, ever-increasing levels of antimicrobial resistance (AMR) threaten the health benefits achieved with antibiotics and this phenomenon is recognized as a global crisis.

The misuse and overuse of antibiotics have resulted in a continuous evolution of bacteria resistant to the drugs that were previously able to control the disease. The main cause of antibiotic resistance is over prescription of antibiotics. Patients not finishing the entire antibiotic course, overuse of antibiotics in livestock and fish farming, poor infection control in health care settings, Poor hygiene and sanitation.

Analysis of publish literature identified the main determinants of antibiotic resistance as irrational use of antibiotic in human and animal species, insufficient patient education when antibiotic are prescribed lack of guideline for treatment and control of infections, lack of scientific information for physicians on rational use of antibiotics, and lack of official government policy on the rational use of antibiotics in public and private hospital.

In Bangladesh, quacks and medicine cellar are prescribing antibiotics invariably resulting in a threat to antibiotic resistant. Patients should be informed that most infections do not require antibiotics; in fact, antibiotics may actually harm a patient by affecting the beneficial bacteria in his or

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her body and may be detrimental to society by encouraging bacterial resistance. Patients should be aware that antibiotics destroy beneficial bacteria as well as pathogens. When infections are treated with an antimicrobial agent, all bacteria in the host are affected, including the normal residents. This can result in the selection of resistant commensal bacteria particularly in children who are frequently given oral antibiotics. These conditions favor the transfer of genes from the surviving organisms to human pathogens. Moreover; non–disease-causing bacteria are essential parts of the body's natural armor against infectious bacteria.

World Antibiotic Awareness Week (12-18 November) 2018 aims to increase global awareness of antibiotic resistance (AMR) and to encourage best practices among the general public, health workers and policy makers to avoid the further emergence and spread of antibiotic resistance. The irrational/misuse use of antibiotic is putting us all at risk. Infections of antibiotic resistant pathogens pose an ever-increasing threat to mankind.

Therefore, this is high time to take combined and coordinated effort at national and international level to combat this alarming situation.

[Journal of Monno Medical College, December 2020;6(2):28-29]

Original Article

Journal of Monno Medical College,
December 2020, Vol. 6, No. 2, pp. 30-36

ISSN (Print) 2412-3277

Estimate the Levels of Zinc, Vitamin E and Linoleic acid in the PALM SKIN Extracts of People with Prolonged Exposure to Arsenic

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Abstract

Background: Zinc, vitamin E and linoleic acid are essential element for our skin. Spirulina, a dietary supplement, rich of these component and improves the symptoms of arsenical palmer keratosis. Objective: The purpose of the present study was to see the levels of zinc, vitamin E and linoleic acid in hand from the skin extracts of aesenicosis patients following spirulina therapy. Methodology: This experimental phase I trial was carried out at Matlab Upazilla, Chandpur District from April to December, 2011 and the type of the study was randomized controlled clinical trial. To understand those element's role, palm skin extracts of moderate palmer arsenical keratosis (n=10), arsenic exposed controls (n=10) and healthy volunteers (n=10) were collected before and after treatment with spirulina powder 10 gm/day orally for 12 weeks. Result: The mean (±SD) amount of zinc in the palm skin of healthy volunteers was 13.1 ± 5.7 ng/cm2, which was not changed significantly in patients (11.3 ± 5.3 ng/cm2). The amount of vitamin E in healthy volunteers was 6.0±0.3 ng/cm2 which was severely reduced in patients (3.5 ± 0.6 ng/cm2). The amount of linoleic acid was lowered in patient (26.7±17.1 ng/cm2) which was statistically significant in comparison to healthy volunteers (p=0.029). After supplementation of spirulina, zinc level in the palm skin of arsenic exposed controls was increased but it was not statistically significant (p=0.068). The vitamin E and linoleic acid levels were not changed significantly in the skin of palm. Conclusion: In conclusion, arsenical keratosis showed significantly low levels of vitamin E and linoleic acid without any significant change in zinc level. After supplementation of spirulina, low levels of these three compounds were not returned towards the normal levels. *[Journal of Monno Medical College, December 2020;6(2): 30-36]*

Keywords: Arsenic; Linoleic acid; Keratosis; Palm skin; Spirulina; Vitamin E; Zinc

Received: 7 October 2020; **Accepted:** 5 November 2020; **Published:** 1 December 2020

Introduction

Many people in Bangladesh are at present suffering from arsenical keratosis. Keratosis occurs inpalms and soles. The involvement of palm and sole is always bilateral that is either both palms or soles or both palms and soles[1]. The presence of keratosis in palm is a social problem, particularly in young unmarried girl.

Arsenical keratosis can be treated by either topicaladministration of drug or oral administration of dietarysupplement or both. Topical administration of salicylic acid[2] or propylene glycol[3] improves the symptoms bysoothing effect. Oral administration of beta-carotene, ascorbic acid, alpha-tocopherol, zinc[4], selenium[5], folic acid, alpha-lipoic acid[6], spirulina[7,8] spinach[9] and corn[10] can reduce body arsenic loadand improve clinical symptoms in skin manifestation inboth experiment animal models and patients. Theseorally administered dietary supplementations are usedeither alone or in combination. However, longerduration (3-12 months) of treatment is required whichultimately affects patient's adherence. Stoppage of this supplementation

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Conflict of interest: We do not have any conflict of interest (financial or others).

How to cite this article: Afrin M, Misbahuddin M, Bhuiyan HA. Estimate the Levels of Zinc, Vitamin E and Linoleic acid in the PALM SKIN Extracts of People with Prolonged Exposure to Arsenic. J Monno Med Coll 2020;6(2): 30-36

recurs the symptoms of keratosis.

Animal study shows that oral administration of eitherzinc or selenium increases the tissue accumulation ofarsenic if co-administered with arsenic contaminated water[11]. It is somewhat difficult to consume arsenic safe drinkingwater. Our foodstuff including staple food rice[12-13] is contaminatedwith arsenic. Among the orally administered supplements, spirulina requires shorter duration of treatment (3 months). In addition, it is a super food containing high protein up to 70.0%, vitamins, minerals, fatty acids and other nutrients[14]. The skin of the palm and sole is thicker than the rest ofthe skin. Palmer skin has no sweat gland. Skin epidermis contains zinc[15], vitamin E[16] and linoleic acid[17].

Linoleic acid maintains physical barrier of skin by somebuffer mechanism. Vitamin E and zinc are antioxidantthat are required for methylation and detoxification ofarsenic in the body, ultimately for the maintenance ofhealth and for the development of optimal physical function[18]. There is depletion ofvitamin E on exposure to ultraviolet radiation[19]. Vitamin E has been found to inhibitcholesterol in patients with atherosclerosis[20]. Skin surface lipids are decreased in theuninvolved skin of the back of hands in patients with atopic dermatitis[21]. The role of zinc, vitaminE and linoleic acid in the pathogenesis of arsenical keratosis is not clear. This study was designed to compare the levels of zinc, vitamin E and linoleic acid in the palmer skin ofarsenical keratosis before and after supplementation of spirulina.

Methodology

This experimental phase I trial was carried out at Matlab Upazilla, Chandpur District (56 km away from Dhaka) from April to December, 2011. There were 13,000 tube wells present in this Upazilla of which about 65% are contaminated with high concentration of arsenic (>50µg/L). A house of a patient was used as a temporary Arsenic Camp. At first 25 patients were selected randomly (computer generated serial number) from the record book of the MatlabUpazilla Health Complex. After inclusion and exclusion criteria, only 14 patients were finally diagnosed clinically as moderate palmer keratosis by a dermatologist. Considering the cost of the study, we finally selected 10 patients at random. Ten arsenic exposed controls were selected from the family members (1 or 2 from each family) of those patients. Ten healthy volunteers were selected from the same Upazilla. The age range of the participants was 20 to 40 years. Both males and females were included. In case of arsenicosis patients, the inclusion criteria were moderate palmer keratosis, drank arsenic contaminated water (>50 µg/L) for at least 6 months, voluntarily agreed to participate in this study. The inclusion criteria for arsenic exposed controls were drank arsenic contaminated water (>50 µg/L) for at least 6 months, no skin manifestation, voluntarily agreed to participate. In case of healthy volunteers, the inclusion criteria were drank arsenic safe water (<50µg/L), no skin manifestation, voluntarily agreed to participate in this study. Moderate keratosis was defined as palpable and visible wart as keratosis (>2 to 5 mm), appearing mainly or exclusively in a symmetric distribution on palm and sole[13]. The exclusion criteria were age <20 and >40 years, pregnant and lactating mother, any systemic disease, inflammatory disease and infectious condition that affects skin (diabetes mellitus, rheumatoid arthritis, systemic lupus erythromatosis), and d) patient getting any treatment of arsenicosis during the study period or within the last three months.

Spirulina Powder: Spirulina powder was collected from the Bangladesh Council for Scientific and Industrial Research (a government organization). 150 g of spirulina powder was given to each participant in a container supplied with a plastic cup size holding 10 g of spirulina powder. Spirulina was supplied to each participant at 2 weeks interval. Every participant was advised to take a cup of spirulina powder mixed with rice during launch for 12 weeks. Compliance of the patient was assured by checking the empty container, while refilling spirulina in the next visit as well as frequent in touch with the patient using mobile phone.

Collection of Samples: Drinking water (50 mL) and urine (50 mL) were collected in plastic container from the participants before starting the study to confirm the diagnosis as patient, arsenic exposed control or healthy volunteer. One drop of nitric acid was added to each container as a preservative. Skin extractions were collected in a glass container (10 mL size) from both the sites of the palm and dorsum of right hand of each participant (Figure 1A). A mixture of two organic solvents chloroform:ethanol (2:1 v/v) was prepared. A glass container containing 4 mL of solvents was delineated over selected sites of the skin surface (area: 3.14 cm2) for 5 min (Figure 1A), and was pressed tightly by manual pressure and then removed (Figure 1B). The extracted solution was then kept for analysis of zinc, vitamin E and linoleic acid levels. Skin extracts from the palm and dorsum of the hand of each participant were collected twice (before and after intervention) at the field level. The samples (skin extract, water and rinse) were carried out on the same day to the laboratory in a container maintaining about -4°C temperature. Finally samples were kept at -20°C before estimation.

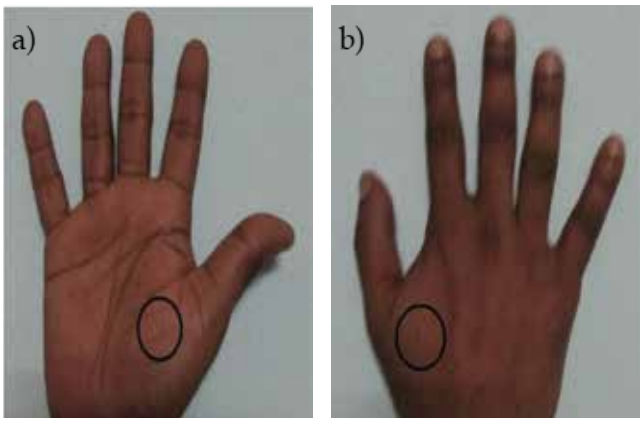

Figure 1A: Sites from which the skin extract were collected. a) palmer side (area 3.14 cm2); b) dorsum side (area 3.14 cm2)

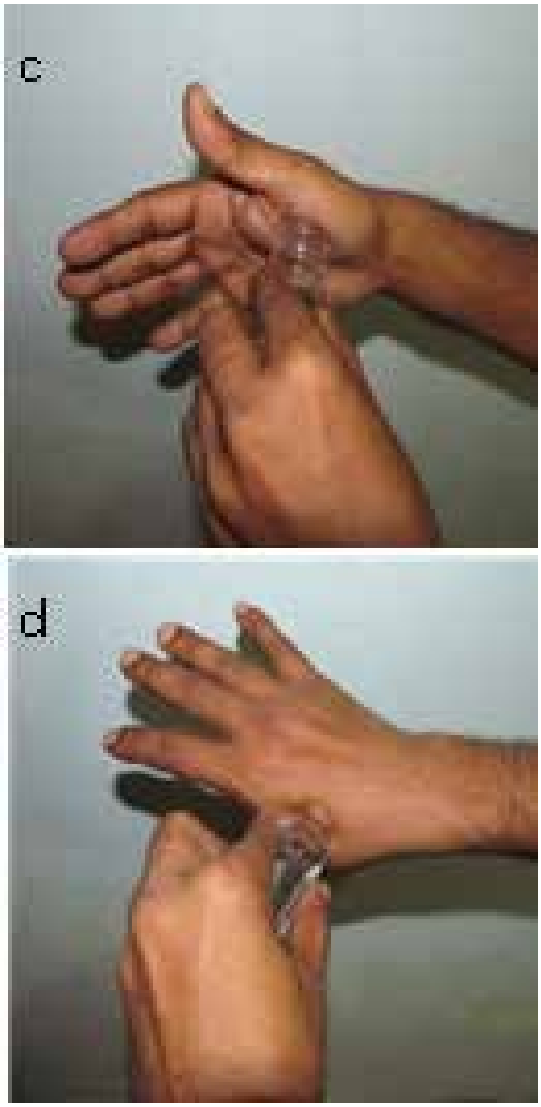

Figure 1B: Procedure of extraction of zinc, vitamin E and linoleic acid from skin; c) before extraction (the solvent of chloroform and ethanol was not in touch of the skin); d) during extraction (the solvent of chloroform and ethanol was in touch of the skin)

Estimation of arsenic[22]**:** Estimation of arsenic in water and urine samples were done by silver diethyldithiocarbamate (SDDC) method. In principle, inorganic arsenic was reduced to arsine (AsH3) by zinc in strong acid solution in an arsine generator. The arsine was then passed through a scrubber containing cotton wool moistened with lead acetate into an absorber tube containing SDDC dissolved in chloroform. The arsine reacted with the silver salt, forming a soluble red color complex whose absorbance was read in a spectrophotometer (UV-VIS Spectrophotometer-1201, Shimadzu, Japan) at 525 nm.

Estimation of zinc[23]**:** The amount of zincin the skin extract was estimated by atomic absorptionspectrometer. Zinc lamp (Buck Scientific, USA) wasused with lamp current 2.0 mA, slit setting 0.7 nm, mode air/acetylene absorbance with wavelength of213.9 nm.

Estimation of vitamin E[22]: VitaminE was estimated by reduction of ferric to ferrous ionswhich then formed a red complex with α, α'-dipyridyl. Tocopherols and carotenes were first extracted intodichloromethane and the absorbance of blank was readat 460 nm to measure carotenes. A correction ofcarotenes was made after adding ferric chloride andabsorbance was recorded at 520 nm.

Estimation of linoleic acid[24]**:** The chromatographic system (ESABiosciences, Inc., Chelmsford, USA) consisted of Model 210 Varian-Prostar solvent delivery module, ESA Model 520 UV/Vis Detector, Rheodyne model 7725 injector with a 20 µL loop (Rheodyne Inc., Cotati, CA, USA) and Model DG4 degasser. Chromatographicseparation was carried out on a Kromasil C18 reversed phase column (4.6 mm × 250 mm ID, 5 µ m particle size (Eka Chemicals, Bohus, Sweden). The mobile phase wasacetonitrile-methanol-water 82:05:13 (v/v), which wasfiltered through a 0.45 µm membrane filter (Millipore) and then degassed ultrasonically prior to use. Theamount of linoleic acid in the product of trans-esterification of collected samples was analyzed by RPHPLCwith UV detector. The flow rate was 1.2 mL/min, the injection volume was 20 µL, the column temperature was maintained at 50°C and UVwavelength was set at 242 nm. Linoleic acid wasidentified by comparing its retention time with that ofthe respective standard (F.A.M.E mix C14 - C22) as wellas cross-comparing with sunflower oil and soybean oilspecimens as they contain highest concentration (%) oflinoleic acid. Quantification was carried out by theintegration of area under the curve (AUC) with the help of the software EZchrom Elite (Scientific Software, Inc.). Calculation of linoleic acid concentration was donemanually from AUC of known standards.

Ethical consideration: The ethical issue of this study was reviewed and approved by the Ethical Committee of Bangabandhu Sheikh Mujib Medical University.

Data collection: After taking the informed written consent, detailed history was taken by interview and clinical examinations were done focusing on arsenical palmer keratosis of the participants. All formation of the study were recorded in data sheet.

Statistical analysis: One way analysis of variance (ANOVA) was employed for comparisons amonggroups and paired Student's 't' test was used forcomparisons before and after treatment with spirulina. The data were expressed as mean ± SD.

Results

The mean amounts (±SD) of arsenic in the drinking water of patients, arsenic exposed controls and healthy volunteers were 646.5±148.0 µg/L, 646.5±148.0 µg/L, 35.1±4.1 µg/L respectively. Patients and arsenic exposed controls drunk water from the same tube well but the amounts of arsenic detected in spot urine were 577.0±125.9 µg/L in patients, 77.1±27.8 µg/L in arsenic exposed controls, non-detectable level in healthy volunteers (Table 1).

The mean duration of arsenic exposure was 18.8±5.4 years in patients and 13.5±4.4 years in arsenic exposed controls. The mean duration of appearance of symptoms in patients was 5.0±2.5 years. The palm skin of patients and arsenic exposed controls showed significant change in the amounts of vitamin E

Table 1: Selected Characteristics of the Participants

Characteristics	Patients	Arsenic Exposed Controls	Healthy volunteers
Number	10	10	10
Age (Year)	33.8±6.3	33.3±5.7	32.5±7.3
Male: Female	4:6	6:4	7:3
Amount of arsenic in tube well water (µg/L)	646.5±148.0	646.5±148.0	35.1±4.1
Duration of arsenic exposure (Year)	18.8±5.4	13.5±4.4	-
Duration of symptoms (Year)	5.0±2.5	-	-
Amount of arsenic in spot urine (µg/L)	577.0±125.9	77.1±27.8	Non-detectable level

Data were presented as mean ± SD; patients and arsenic exposed controls had same source of drinking water

Table 2: Baseline zinc, vitamin E and Linoleic Acid Levels at Palm and Dorsum Skin of Patients, Arsenic Exposed Controls and Healthy Volunteers

Group	Zinc level		Vitamin E		Linoleic acid level	
	Mean ± SD	P value	Mean ± SD	P value	Mean ± SD	P value
Palm Skin						
Patients (P)	11.3±5.3	0.330	3.5±0.6	0.000	26.7±17.1	0.114
Arsenic Exposed Controls (A)	9.7±3.8		5.6±0.3		46.2±39.2	
Healthy volunteers (H)	13.1±5.7		6.0±0.3		59.5±40.5	
P vs A	0.452		0.000		0.167	
P vs H	0.458		0.000		0.030	
A vs H	0.131		0.006		0.464	
Dorsum Skin						
Patients (P)	8.0 ± 2.5	0.069	3.4 ± 0.6	0.000	26.3 ± 15.5	0.018
Arsenic exposed controls (A)	9.9 ± 3.5		3.7 ± 0.6		34.6 ± 22.8	
Healthy volunteers (H)	12.0 ± 4.7		5.9 ± 0.6		60.0 ± 35.1	
P vs A		0.178		0.372		0.356
P vs H		0.030		0.000		0.012
A vs H		0.285		0.000		0.071

Table 3: Effect of Spirulina on the Amounts of Zinc in the Palm and Dorsum Skins of Patients, Arsenic Exposed Controls and Healthy Volunteers (mean±SD)

Group	n	Amount of zinc in palm skin (ng/cm^2)		Percent increase/ decrease	P value	Amount of zinc in dorsum skin (ng/cm^2)		Percent increase/ decrease	P value
		Before Treatment	After treatment			Before Treatment	After treatment		
Patients	10	11.3±5.3	10.6±5.7	↓6.2%	0.773	8.0±2.5	9.3±4.7	↑16.3%	0.454
Arsenic exposed controls	10	9.7±3.8	14.0±5.7	↑43.3%	0.068	9.9±3.5	9.5±5.4	↓4.0%	0.788
Healthy volunteers	10	13.1±5.7	12.6±3.5	↓3.8%	0.808	12.0±4.7	10.1±3.2	↓15.8%	0.312

Table 4: Effect of Spirulina on the Amounts of Vitamin E in the Palm and Dorsum Skins of Patients, Arsenic Exposed Controls and Healthy Volunteers

Group	n	Amount of vitamin E in palm skin (ng/cm^2)		Percent increase/ decrease	P value	Amount of vitamin E in dorsum skin (ng/cm^2)		Percent increase/ decrease	P value
		Before Treatment	After treatment			Before Treatment	After treatment		
Patients	10	3.5 ± 0.6	3.9 ± 0.6	↑11.4	0.085	3.4 ± 0.6	3.6 ± 0.6	↑16.3%	0.454
Arsenic exposed controls	10	5.6 ± 0.3	5.8 ± 0.3	↑3.5	0.111	3.7 ± 0.6	4.1 ± 0.3	↓4.0%	0.788
Healthy volunteers	10	6.0 ± 0.3	6.0 ± 0.0		0.704	5.9 ± 0.6	6.1 ± 0.6	↓15.8%	0.312

Table 5: Effect of Spirulina on the Amounts of Linoleic Acid in the Palm and Dorsum Skins of Patients, Arsenic Exposed Controls and Healthy Volunteers

Group	n	Amount of linoleic acid in palm skin (ng/cm^2)		Percent increase/ decrease	P value	Amount of linoleic acid in dorsum skin (ng/cm^2)		Percent increase/ decrease	P value
		Before Treatment	After treatment			Before Treatment	After treatment		
Patients	10	26.7±17.1	31.9±15.5	↑19.4	0.482	26.3±15.5	35.5±27.2	↑35.0	0.369
Arsenic exposed controls	10	46.2±39.2	61.3±35.7	↑32.7	0.378	34.6±22.8	61.1±28.8	↑76.6	0.035
Healthy volunteers	10	59.5±40.5	84.4±39.5	↑41.8	0.179	60.0±35.1	83.6±30.7	↑39.3	0.124

whereas the dorsum skin showed significant change in both vitamin E and linoleic acid levels (Table 2).

There were no change in the amount of zinc, vitamin E and linoleic acid in the palm skins of patients, arsenic exposed controls and healthy volunteers following supplementation of spirulina for 12 weeks. Significant changes were observed in the vitamin E and linoleic acid levels of the dorsum skin of arsenic exposed controls (Table 3-5).

Discussion

This study shows that amounts of vitamin E and linoleic acid in the palm skin of patients were low in comparison to health volunteers and arsenic exposed controls. However, the zinc level was not affected significantly. The amount of zinc, vitamin E and linoleic acid in the dorsum skin of patients were low in comparison to healthy volunteers and arsenic exposed controls. After supplementation of spirulina for 12 weeks, there were no significant increase in the level of zinc, vitamin E and linoleic acid level both in palm and dorsum skin. On arsenic exposure, there were no significant decrease in zinc and linoleic acid level in both palm and dorsum skin. But significant decrease in vitamin E levels in both the sites. After supplementation of spirulina, palmer skin shows no significant increase in zinc, vitamin E and linoleic acid. But dorsum skin shows significant increase in linoleic acid level.

When a person is consuming high concentration of arsenic chronically until the appearance of skin manifestation, then the skin of both palm and dorsum shows low amount of vitamin E without significant change in either zinc or linoleic acid levels. Arsenic produces oxidative stress[25] which ultimately affects vitamin E. Vitamin E is a lipid soluble antioxidant whereas zinc is a water soluble antioxidant. It is well-known that vitamin E protects long-chain polyunsaturated fatty acids and thus maintain their concentrations for important signaling events[26]. That is why, vitamin E level is decreased without affecting the fatty acid level like linoleic acid. In patient of palmer arsenical keratosis, the vitamin E level is further decreased and the normal level of linoleic acid is not maintained. Linoleic acid level is low. However, zinc level is not affected significantly. However, it is quite interesting that the dorsum skin of patient cannot maintain the normal zinc level. That is, at the site of keratosis, the level of zinc is maintained to normal level.

Our previous study shows that the secretion of vitamin E from the site of skin having melanosis is higher in arsenic-exposed control and highest in patient[26]. There is no data about the secretion of vitamin E and zinc from the palm of the patient and arsenic exposed control. Increased secretion of vitamin E from the palm skin, like the skin having melanosis, may be responsible for the low level of

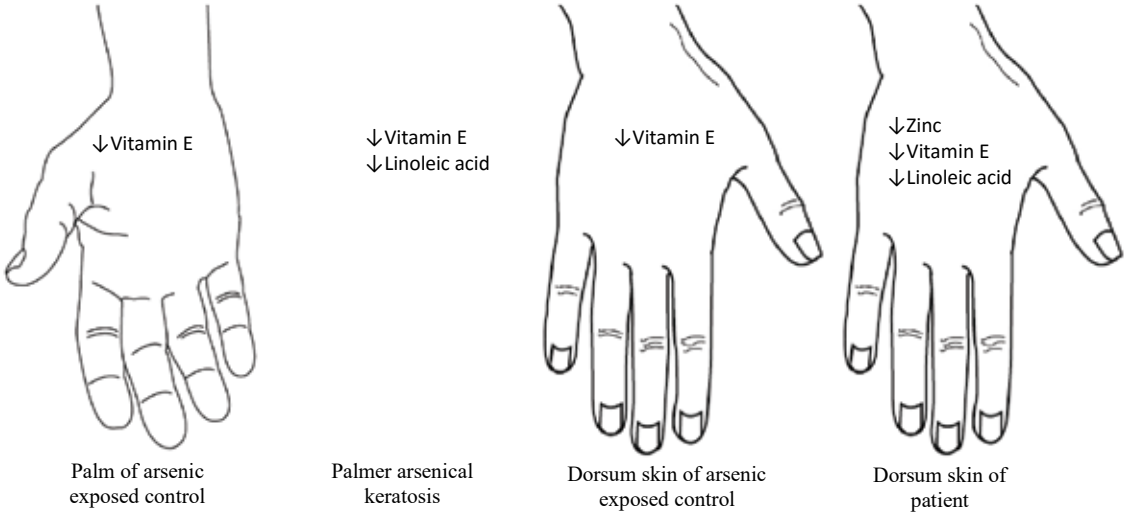

Figure 2: The levels of zinc, vitamin E and linoleic acid in the palmer and dorsum skins of patient and arsenic exposed control

vitamin E in patient and arsenic exposed control. Similarly chronic intake of arsenic leads to several folds higher secretion of zinc from the site of skin having melanosis both in patients and in arsenic-exposed controls[26]. One molecule of arsenic appears to be co-secreted with two molecules of zinc. It is quite natural to think that zinc level in the skin of palm must be low. In this study, low level of zinc is only observed in the dorsum skin of arsenic exposed controls. It remains unclear.

Spirulana is a super food. It contains zinc, vitamin E and linoleic acid. So, it is quite natural to think that supplementation will increase the amount zinc, vitamin E and linoleic acid in skin. Surprisingly, these substances are not increased even in healthy skin. Only linoleic acid level is increased in the dorsum skin of arsenic exposed controls. Supplementation with spirulina shows clinical improvement of keratosis[8]. This present study shows that there is no significant increase in the level of zinc, vitamin E and linoleic acid in the palmer as well as dorsum skin.

When a healthy person consumes chronically high concentration arsenic, then he or she develops at first mild keratosis, which subsequently deteriorated to form moderate and severe keratosis. If the pathological process continues, then malignancy develops. If we understand the pathological process of development of malignancy, then we can stop this skin manifestation following chronic consumption of arsenic. There are two peculiarities in the skin manifestations of Bangladeshi following chronic consumption of high concentration of arsenic. First, keratosis develops only at the palm or sole without affecting the skin of the rest of the body. Second, basal cell carcinoma is not common; instead a few cases of Bowen's disease are reported. In addition, all the members of a family consuming high concentration of arsenic but one or two may develop skin manifestations. We do not have the explanation of these two observations. Our diets have some unidentified components that may protect us from the consequences of consuming high concentration of arsenic.

Patients and arsenic exposed controls drunk water from same tube well but the amounts of arsenic detected in spot urine were several fold higher in patients than in arsenic exposed controls. The risk for skin lesions in relation to the arsenic exposure estimates based on urinary arsenic was elevated more than 3-fold[27]. The sample size is small. Further studies are required before drawing any conclusion.

Conclusion

In conclusion, chronic arsenic exposure leads to low level of vitamin E in the skin of palm. In case of palmer keratosis, there is increased utilization of vitamin E followed by low amount of linoleic acid. Zinc level may have a role in the development of palmer keratosis. Supplementation with spirulina improves keratosis without significant increase in the level of vitamin E and linoleic acid at the palm skin.

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Original Article

Journal of Monno Medical College,
December 2020, Vol. 6, No. 2, pp. 37-40

ISSN (Print) 2412-3277

Bacteriological Profile and Antimicrobial Susceptibility Pattern of Endotracheal Aspirates of Patients in ICU of a Tertiary Care Hospital in Dhaka, Bangladesh

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Abstract

Background: Nosocomial infections have been discussed as a critical issue among intubated patients leading to significant morbidity and mortality. Tracheal colonization of different bacteria may be responsible for added or superinfections and may increase the risk of mortality. Irrational use of antibiotics also increases the emergence of drug-resistant bacteria. **Objectives:** The purpose of the present study was to find out the bacterial isolates in the endotracheal aspirates of ICU patients and to see the pattern of antimicrobial susceptibility. **Methodology:** This cross-sectional study was based on 50 specimens of endotracheal aspirates which were collected from ICU patients of Dhaka Medical College and Hospital over a period of one year, from July 2015 to June 2016. All the specimens were processed and cultured on MacConkey and blood agar media. The isolated organisms were identified by different biochemical tests. Antimicrobial susceptibility test was done for all isolated bacteria by disc diffusion method. **Results:** Among the 50 specimens, 96% yielded growths of different bacteria. Of them, most predominant bacteria was *Acinetobacter baumannii* (39.6%) followed by *Pseudomonas aeruginosa* (14.6%), *Klebsiella pneumoniae* (14.6%), *Klebsiella oxytoca* (10.4%), *Esch. coli* (6.3%), *Staphylococcus aureus* (4.2%), *Citrobacter freundii* (4.2%), *Citrobacter koseri* (2.1%), *Proteus mirabilis* (2.1%) and *Enterobacter aerogens* (2.1%). Most of the isolated bacteria were sensitive to colistin and tigecycline but resistant to amoxiclav, most of the cephalosporins and animoglycosides. **Conclusion:** Most of the bacteria showed resistance to different commonly used antibiotics, which is very alarming for the ICU patients. *[Journal of Monno Medical College, December 2020;6(2): 37-40]*

Keywords: Endotracheal aspirate; ICU; nosocomial infection; culture; antimicrobial susceptibility

Received: 7 October 2020; **Accepted:** 5 November 2020; **Published:** 1 December 2020

Introduction

Hospital-acquired infection (HAI) is a serious and burning problem worldwide and is responsible for high rate of morbidities and mortalities[1]. It has been shown that in developed countries 5.0% to 15.0% patients in general wards and 50% patients in intensive care units (ICU) suffered from HAI[2]. In developing countries this burden is somewhat underestimated, which may be due to lack of knowledge of proper surveillance, proper resources and proper guidance[2]. In ICU most of the patients suffer from urinary tract infection, post-surgical infection and lower respiratory infection[3].

The modern apparatus responsible for HAI are endotracheal tube, catheter and different surgical appliances[4]. Tracheal colonization of different bacteria may be responsible for added or superinfections and at the same time, increases the risk of mortality[5]. Again due to irrational use of antibiotics, there is increasing emergence of drug-resistant bacteria[6].

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Conflict of interest: We do not have any conflict of interest (financial or others).

How to cite this article: Sultana S, Rahman T, Asifudduza M, Begum M, Rabbi FI, Jahan T, Shamsuzzaman SM. Bacteriological Profile and Antimicrobial Susceptibility Pattern of Endotracheal Aspirates of Patients in ICU of a Tertiary Care Hospital in Dhaka, Bangladesh. J Monno Med Coll 2020;6(2): 37-40

These gram-negative drug resistant bacteria are prevalent all over the world[7]. Therefore, the purpose of the study was to detect different pathogens from endotracheal aspirate in ICU patients and to see their antimicrobial susceptibility pattern.

Methodology

This cross-sectional study was carried out on 50 specimens of endotracheal aspirates collected from ICU patients of Dhaka Medical College and Hospital. This study was done in the department of Microbiology, Dhaka Medical College (DMC), Dhaka from July 2015 to June 2016. Patients with clinically suspected respiratory tract infection who got admitted 48 hours before in ICU of Dhaka Medical College and Hospital (DMCH) irrespective of age, sex and antibiotic used were included in this study. Informed written consent was taken from all patients or their legal guardians before specimen collection. Endotracheal tube aspirates were collected from patients in ICU having mechanical ventilation for more than 48 hours. With all aseptic precaution endotracheal aspirate (ETA) was collected by using a 50 cm and 14 Fr sterile suction catheter, which was gently introduced through the endotracheal tube for a distance of approximately 25-26 cm. The ETA was obtained by suction, without instilling saline and the catheter was withdrawn from the endotracheal tube. Two ml of PBS (Phosphate buffer Saline) was injected into suction catheter with a sterile syringe to flush the exudates into a sterile falcon tube for collection and were transported immediately to the laboratory for further processing[8]. ETA was mechanically homogenized by vortexing for one minute with glass bead (1-2 glass bead)[9]. Then centrifuged at 2000 g for 10 minutes. Two ml supernatant was discarded using a sterile pipette and deposit was further mixed by vortexing, processed specimen was used for culture. Endotracheal aspirate was streaked by using a sterile wire loop. 0.01 ml of sample solution was inoculated in blood agar and MacConkey agar media in three sectors consecutively. After inoculation, all the media were incubated overnight at 37ºC. The microbiological growth of endotracheal aspirate was classified as rare, light, moderate or heavy, based on the number of colonies in each of 3 sectors shown in the table (Table 1)[10]. Moderate to heavy growth were considered as significant[11]. For confirmation of Staphylocoocus spp. subculture was done on mannitol salt agar medium from blood agar medium and incubated at 37ºC for 24 hours and examined after 24 hours. All the isolated organisms were identified by their colony morphology, staining characters and further confirmed by relevant biochemical tests. Susceptibility to antimicrobial agents of all isolates was done by Kirby Bauer modified disc diffusion technique using Mueller Hinton agar plates and zones of inhibition were interpreted according to CLSI guidelines (2015)[12]. Antibiotic discs such as ceftazidime (30 µg), cefotaxime (30 µg), ceftriaxone (30 µg), cefepime (30 µg), amoxiclav (amoxicillin 20 µg & clavulanic acid 10 µg), ciprofloxacin (5 µg), amikacin (30 µg), gentamicin (10 µg), piperacillin-tazobactam (100/10 µg), imipenem (10 µg), meropenem (10 µg), oxacillin (1 µg⁄disc), vancomycin (30 µg⁄disc), cefoxitin (30 µg⁄disc), linezolid (30 µg⁄disc), tigecycline (15 µg) and colistin (10 µg) were used. Susceptibility to tigecycline was determined by using 15 µg tigecycline disc and interpretated according to the criteria of the United States Food and Drug Administration[13].

Table 1: Semi-Quantitative reporting of microbial growth in cultures of ETA performed in petri dishes

Report	Number of Colonies In Each Sector		
	1st	2nd	3rd
Rare	<10	0	0
Light	≥10	<5	0
Moderate	≥10	≥5	<5
Heavy	≥10	≥5	≥5

Results

Among the 50 endotracheal aspirates, 2 (4%) yielded no growth in culture. Of the 48 isolated organisms, 19 (39.6%) were Acinetobacter baumannii, 7 (14.6%) were Pseudomonas aeruginosa, 7 (14.6%) were Klebsiella pneumoniae, 5 (10.4%) were Klebsiella oxytoca, 3 (6.3%) were Esch. coli, 2 (4.2%) were Staphylococcus aureus, 2 (4.2%) were Citrobacter freundii, one (2.1%) was Citrobacter koseri, one (2.1%) was Proteus mirabilis and one (2.1%) was Enterobacter aerogens (Table 2).

Table 2: Distribution of bacteria isolated from endotracheal aspirate samples (n= 48).

Bacteria	Frequency	Percent
Acinetobacter baumannii	19	39.6
Pseudomonas aeruginosa	7	14.6
Klebsiella pneumoniae	7	14.6
Klebsiella oxytoca	5	10.4
Esch. coli	3	6.3
Staphylococcus aureus	2	4.2
Citrobacter freundii	2	4.2
Citrobacter koseri	1	2.1
Proteus mirabilis	1	2.1
Enterobacter aerogenes	1	2.1
Total	**48**	**100.0**

According to antimicrobial resistance pattern to different antibiotics, Acinetobacter baumannii showed highly resistant to amoxiclav, ceftazidime, ceftriaxone, cefotaxime and cefepime (92.3%). Minimum resistance was shown towards colistin (11.5%) and tigecycline (23.1%). Klebsiella species showed resistant to amoxiclav, ceftazidime, ceftriaxone, cefotaxime and ciprofloxacin (83.3%) and lesser resistance was shown to imipenem, meropenem (25%), colistin (16.7%) and tigecycline (8.3%). Pseudomonas aeruginosa were found resistant to amoxiclav, ceftriaxone, cefotaxime, cefepime (85.7%) followed by ceftazidime, amikacin, gentamicin, ciprofloxacin (71.4%), piperacillin-Tazobactum (42.9%), imipenem, meropenem (28.5%) and colistin (14.3%). Among the isolated Staphylococcus aureus,

Table 1: Selected Characteristics of the Participants

Antimicrobioal agent	*Acinetobacter baumannii* (n=26)	*Pseudomonas aeruginosa* (n=7)	*Klebsiella species* (n=12)	*Esch. coli* (n=03)	*Citrobacter species* (n=03)	*Staph. aureus* (n=2)
Imipenem	21 (80.8%)	2 (28.5%)	3 (25.0%)	1 (33.3%)	0 (0.0%)	-
Meropenem	21 (80.8%)	2 (28.5%)	3 (25.0%)	1 (33.3%)	0 (0.0%)	-
Ceftriaxone	24 (92.3%)	6 (85.7%)	10 (83.3%)	2 (66.7%)	2 (66.7%)	1 (50.0%)
Ceftazidime	24 (92.3%)	5 (71.4%)	10 (83.3%)	2 (66.7%)	2 (66.7%)	-
Cefotaxime	24 (92.3%)	6 (85.7%)	10 (83.3%)	2 (66.7%)	2 (66.7%)	-
Cefepime	24 (92.3%)	6 (85.7%)	9 (75.0%)	2 (66.7%)	2 (66.7%)	-
Amoxiclav	24 (92.3%)	6 (85.7%)	10 (83.3%)	2 (66.7%)	2 (66.7%)	-
Amikacin	22 (84.6%)	5 (71.4%)	8 (66.7%)	1 (33.3%)	2 (66.7%)	1 (50.0%)
Gentamicin	22 (84.6%)	5 (71.4%)	9 (75.0%)	1 (33.3%)	2 (66.7%)	1 (50.0%)
Ciprofloxacin	22 (84.6%)	5 (71.4%)	10 (83.3%)	2 (66.7%)	2 (66.7%)	2(100.0%)
Piperacillin-Tazobactam	23 (88.5%)	3 (42.9%)	8 (66.7%)	1 (33.3%)	1 (33.3%)	-
Colistin	3 (11.5%)	1 (14.3%)	2 (16.7%)	0 (0.0%)	0 (0.0%)	-
Tigecycline	6 (23.1%)	-	1 (8.3%)	0 (0.0%)	0 (0.0%)	-
Cefoxitin	-	-	-	-	-	0 (0.0%)
Oxacillin	-	-	-	-	-	0 (0.0%)
Vancomycin	-	-	-	-	-	0 (0.0%)
Leinezolid	-	-	-	-	-	0 (0.0%)

Discussion

Infections are the most important and the leading cause of mortality and morbidity in ICU[14]. Endotracheal tubes are susceptible to infection and therefore it is important to be aware of the relevant factors and responsible organisms to take prompt action[5]. The findings of this study would be helpful in selection of appropriate antibiotics.

In this study, 50 endotracheal aspirates are studied and organisms are isolated from 48 specimens. Among the isolated organisms, 19 (39.6%) are *Acinetobacter baumannii*, 7 (14.6%) are *Pseudomonas aeruginosa*, 7 (14.6%) are *Klebsiella pneumoniae*, 5 (10.4%) are *Klebsiella oxytoca*, 3 (6.3%) are *Esch. coli* and 2 (4.2%) are *Staphylococcus aureus*. Out of 48 significant growths in semiquantitative culture positive cases, gram-negative bacteria are isolated in 46 (95.8%) cases. Amini et al[15] reported that gram-negative bacilli accounted for 83% among all isolates. The most commonly identified organism was Acinetobacter spp. followed by Pseudomonas aeruginosa in that study. In another study, gram-negative bacilli accounted for 86% among all isolates and the most commonly identified organism was Acinetobacter spp. followed by *Klebsiella pneumoniae*[16]. *Klebsiella pneumoniae* (34%) was the most common isolate, followed by *Pseudomonas aeruginosa* (20%) and *Acinetobacter species* (18%) in another study[9]. In a study done by Dominic et al[17] in Kasturba Medical College Hospital, Mangalore, reported that the majority of bacteria in their study were gram-negative bacilli (81.14%), among them *Pseudomonas spp.* accounted for 41.14%, *Klebsiella spp.* 15.43%, *Acinetobacter spp.* 10.28%. In this study, 4.2% *Staphylococcus aureus* are found but incidence of *Staphylococcus aureus* is 15.2% in another study which is significantly higher than findings in our study[18]. This variation in the pattern of bacterial isolates may be due to the fact that the studies were done in different geographical areas. Other factors are differences in patient population, exposure to antibiotic, type of ICU patient, length of ICU stay and the method used for diagnosis of ventilator-associated pneumonia (VAP)[15].

In this study, most (80.8%) of the *Acinetobacter baumannii* are resistant to imipenem. High percentages (29%) of *Acinetobacter baumannii* strains resistant to imipenem were reported in another study[19]. In BSMMU a study showed that 38% of the *Acinetobacter* were imipenem resistants[20]. Since last 10 years, resistance to imipenem has been increasingly reported worldwide in non-fermenting gram-negative bacilli (NFGNB) including Acinetobacter spp[21]. In this study, most (92.3%) of the Acinetobacter baumannii are resistant to ceftazidime, ceftriaxone, cefotaxime, cefepime and amoxiclav. Mansour and Rhman[22] reported that 80% *Acinetobacter baumannii* were resistant to ceftriaxone and ceftazidime and 83% were resistant to amoxiclav that is almost in agreement with the present study. Infection by metallo-β-lactamase (MBL) producing organism including blaNDM-1 producers are increasing in the last few years in Bangladesh, which are resistant to most of the commonly used third generation cephalosporin including imipenem[23,24].

In the present study, Pseudomonas aeruginosa are found resistant to amoxiclav, ceftriaxone, cefotaxime, cefepime (85.7%) followed by ceftazidime, amikacin, gentamicin, ciprofloxacin (71.4%). Colistin is found most sensitive against *Pseudomonas aeruginosa* (14.3%). Isolated *Pseudomonas aeruginosa* are imipenem sensitive in 71.5% and piperacillin-Tazobactum sensitive in 57.1% cases. In contrast, *Pseudomonas* was most sensitive to amikacin

(52.78%) and ceftazidime (47.22%) in a study done by Taj et al[25] in Pakistan.

In the present study, (83.3%) Klebsiella species are resistant to amoxiclav, ceftazidime, ceftriaxone, cefotaxime and ciprofloxacin. Most of the isolates are sensitive to imipenem, meropenem (75%), colistin (83.3%) and tigecycline (91.7%). Nazma et al[26] reported that among the nine isolated *Klebsiella spp.*, (88.89%) were resistant to ceftriaxone and ciprofloxacin, (77.78%) were resistant to gentamicin. All (100%) of the isolated *Klebsiella spp.* were sensitive to colistin and 77.78% to imipenem. These results are very much similar to the present study. In this study, all (100%) isolated *Staphylococcus aureus* are sensitive to linezolid. Another study also found that all the *Staphylococcus were* sensitive to linezolid[26].

Conclusion

In conclusion, this study presents the most common microorganisms colonized from endotracheal tube of hospitalized patients and their pattern of antibiotic resistance. This study shows that *Acinetobacter baumannii* are the most common bacteria and most of them are resistant to common antibiotics, which is alarming for developing countries like Bangladesh. The antibiotic colistin is found sensitive for most of the organisms in the present study.

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Original Article

Journal of Monno Medical College,
December 2020, Vol. 6, No. 2, pp. 41-44

ISSN (Print) 2412-3277

Analysis of 50 Cases of Pap s Smear by Using Cytobrush at Medical University of Bangladesh

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Abstract

Background: Papa's smear by using cytobrush is a standard test for cervical cancer screening. However most important challenge is high false negative results due to inadequate sampling using Ayre's spatula. **Objective:** This study tried to decreasing false negative results by the test Pap's smear by using cytobrush which is a screening test for cervical cancer. **Methodology:** This cross-sectional study was carried among outdoor patient of Department of Obstetrics and Gynaecology at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh during January to July 2009 for a period of six months. **Result:** In this study, by using cytobrush malignant cells, infection & dysplasia was found in 4.0%, 24.0%, and 4.0% cases respectively, whereas, it was 2.0%, 28.0% & 4.0% cases by using Ayre's spatula respectively. Endocervical cells were absent in 8% cases in women of the cytobrush group as compared to 24% in Ayre's spatula group. **Conclusion:** This study concludes that use of cytobrush is recommended in the interest of reducing the number of false negative results. *[Journal of Monno Medical College, December 2020;6(2): 41-44]*

Keywords: Cytobrush; Pap's smear; Ayre's spatula

Received: : 7 June 2020; **Accepted:** 11 November 2020; **Published:** 1 December 2020

Introduction

Sixty years ago, cervical cancer was a cause of death in woman. Mortality has reduced by 50.0% since then, and this reduction has been credited to the development and use of a cytologic screening tool known as papanicolaou smear[1]. Unfortunately, using traditional methods, false negative results are high. About two thirds of these false negative smears are due to inadequate sampling of the cervix, while one-third were due to laboratory error.

The primary cause of sampling error was failure to obtain cells from the squamo-columner transition zone, where cervical cancer is known to develop. As a result of false negative reports, diseases are not diagnosed early and lead patients to advanced malignancy which eventually bring about the increase in the morbidity and mortality rates[2]. A pap's smear is a medical procedure in which a slide is prepared by taking sample of cells from women's cervix. Then the slide is examined under a microscope for premalignant or malignant changes of cells. Seventy-five percent early cervical cancers are found only above the external os in the endocervical canal. The squamo-colurnnar transition zone is one of the causes of the lower recovery rate of endocervical cells from such patients. Therefore, endocervical canal must be sampled in all instances result of pap's smear can be improved by application of correct tools like using cytobrush, proper training, cytologist etc. If result still abnormal, next to have a colposcopy for further evaluation[12]. Age for Pap's test 21 year or older or have been sexually active for 3 years or more. Typically about 0.5% of result indicate cancer; 0.2 to 0.8% indicate atypical squamous

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Conflict of interest: We do not have any conflict of interest (financial or others).

How to cite this article: Siddiqua A, Karim MR, Moniruzzaman SM, Rahman M, Sharmin MI, Ali L, Alam MR. Analysis of 50 Cases of Pap's Smear by Using Cytobrush at Medical University of Bangladesh. J Monno Med Coll 2020;6(2): 41-44

cells of undetermined significance[3]. Abnormal results are reported according to the Bethesda system.

The cervical cytobrush was developed to improved cell recovery on pap smear. Special advantages of cytobrush as follows: reduce in the number of false negative results, because making enough sample from endocervix, sampling with such device is very easy, spreading samples on slides is very comfortable and can be done in one step, instead of pulling spatula twice on slides, the transmission of infection to women is less due to one step sampling, it is easy to use in females with longer cervical canal reduce in cervical bleeding in women with fragile cervical tissue because of one step sampling, it can be easily passes in to stenotic cervix: Pathology report is more accurate because of less bloody samples and enough obtained cells on the slide spread on a thin layer .Therefore the study was designed to test whether the use of cytobrush improves sample quality than those with the use of Ayre's spatula as is the routine practice in our country[4].

Methodology

This was a cross-sectional study which was carried among outdoor patient of Department of Obstetrics and Gynaecology at Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh during January to July 2009 for a period of six months. Married, non-pregnant women of reproductive age, post-menopausal women & high risk patients reported to gynaecology outpatient department for her gynaecological problems taken as inclusions criteria And any patient clinically diagnosed as a case of cervical malignancy, pregnant, who had underwent hysterectomy, genital prolapse & patient with any polypoidal growth as exclusion criteria. A questionnaire was prepared for the present study. Data was collected by directly questioning the patient. Then after a thorough physical examination reports of Pap's smear was collected from pathology department noted at data collection shed. Then data were analysis by using appropriate statistical test. After analyzing data they were presents by tabulated and graphic form. Inference was drawn according to findings of the study. Purposive sampling technique was applied.

Results

In this study fifty women of age range between 15 to 65 years were included. Malignant cells were found by using cytobrush in 4.0% (in women of more than 45 years), infection 24.0% and dysplasia 4% were more common in 26 to 35 years age group. Whereas by using Ayre's spatula, malignant cells found in 2.0% cases in women of more than 55 years of age, infection 28.0% cases in 26 to 35 years of age and dysplasia found 4.0% cases at 36 to 45 age group (Table 1).

Infection was the commonest findings about 50.0% cases where as 32.0% cases were normal study. Dysplasia and malignancy was in 12.0% and 6.0% cases (Figure I).

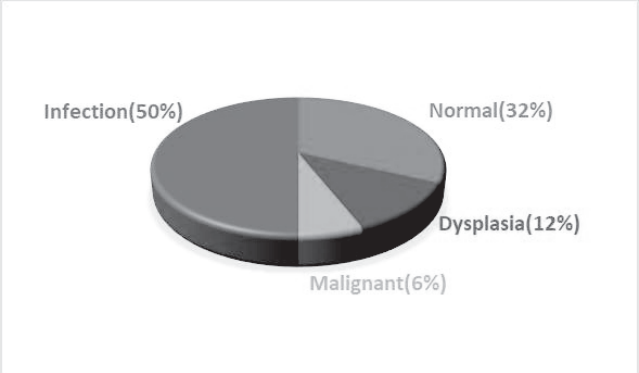

Figure I: Percentage of Normal Cytology, Infection, Dysplasia, Malignancy and Infection among 50 Cases (By cytobrush)

Table 3 showed higher percentage of detection of dysplasia (6%) by using cytobrush in relation to Ayre's spatula (4%) among contraceptive users.

The endorcervical cells were absent in 4(8%) women of the cytobrush group as compared to 12(24%) in the Ayre's spatula group. In this study satisfactory sides were more found by using cytobrush (92.0%). In this study, satisfactory slides were more found by using cytobrush (92.0%), whereas it was less by Ayres

Table 1: Distribution of Pap's Smear result with age by using cytobrush and Ayre's spatula (n=50)

Age Group		Normal	Infected	Dysplasia	Malignant	Total
15 to 25 Years	Cytobrush	6(12.0%)	3(6.0%)	0(0.0%)	Nill	9
	Ayre's spatula	6(12.0%)	3(6.0%)	0(0.0%)	Nill	9
26 to 35 Years	Cytobrush	3(6.0%)	12(24.0%)	2(4.0%)	Nill	17
	Ayre's spatula	2(4.0%)	14(28.0%)	1(2.0%)	Nill	17
36 to 45 Years	Cytobrush	3(6.0%)	8(16.0%)	2(4.0%)	Nill	13
	Ayre's spatula	1(2.0%)	10(20.0%)	2(4.0%)	Nill	13
46 to 55 Years	Cytobrush	2(4.0%)	1(2.0%)	1(2.0%)	2(4.0%)	6
	Ayre's spatula	2(4.0%)	3(6.0%)	1(2.0%)	Nill	6
56 to 65 Years	Cytobrush	2(4.0%)	1(2.0%)	1(2.0%)	1(2.0%)	5
	Ayre's spatula	1(2.0%)	2(4.0%)	1(2.0%)	1(2.0%)	5

Table 2: Percentage of Infection with severity among 50 cases (n=26)

Severity of Infection		15-25 years (n=6)	26-35 years (n=4)	36-45 years (n=18)	45-55 years (n=4)	56-65 years (n=3)	Percentage
Mild	Ayre s spatula	1	8	6	1	1	345
	Cytobrush	2	7	5	Nill	1	30%
Moderate	Ayre s spatula	2	4	3	1	1	22%
	Cytobrush	1	4	3	1	Nill	18%
Severe	Ayre s spatula	Nill	2	1	1	Nill	4%
	Cytobrush	Nill	1	Nill	Nill	2%	30%

Table 2 shows higher percentage of infection is detected by Ayre's spatula in compared to cytobrush.

Table 3: Relation of contraceptive with infection & dysplasia ("A" means slide prepared by using Ayer's spatula and "B" means slide prepared by using cytobrush)

Name of contraceptives	Total		Normal findings (A -20) (B -16)	Infection (A -26) (B -25)	Dyslaysia (A -3) (B -6)	Malignancy (A -1) (B -3)
OCP	30	Ayre s spatula	12(24%)	15(30%)	2(4%)	1(2%)
		Cytobrush	10(20%)	15(30%)	3(6%)	2(4%)
Condom	10	Ayre s spatula	4(8%)	6(12%)	Nill	Nill
		Cytobrush	3(6%)	7(14%)	Nill	Nill
Injectable Contraceptive	1	Ayre s spatula	1(2%)	Nill	Nill	Nill
		Cytobrush	Nill	2(4%)	Nill	Nill
IUCD	2	Ayre s spatula	Nill	2(4%)	Nill	Nill
		Cytobrush	1(2%)	1(2%)	Nill	1(2%)
Tubectomy	1	Ayre s spatula	Nill	Nill	1(2%)	Nill
		Cytobrush	Nill	Nill	1(2%)	Nill
No Contraceptive	6	Ayre s spatula	3(6%)	2(4%)	1(2%)	Nill
		Cytobrush	2(4%)	2(4%)	2(4%)	Nill

Table 3 showed higher percentage of detection of dysplasia (6%) by using cytobrush in relation to Ayre's spatula (4%) among contraceptive users.

spatula (76.0%). Smears obtained by cytobrush had spatula and/or cytobrush was reported. There was bleeding in both methods, and none of the slides was reported by pathologist to be bloody sample (Table 4).

Table 4: Smear Quality in Cytobrush and Ayre's Spatula

Result	Cytobrush (n=50)	Ayre's Spatula (n=50)
Satisfactory	46(92.0%)	38(76.0%)
Absent endocervical	4(8.0%)	12(24.0%)
Repeat need for smear	4(8.0%)	12(24.0%)

Discussion

Carcinoma of cervix is a progressive disease. The main objective of cervical cancer control program is to prevent the onset of invasive carcinoma through early detection. Diagnosis & treatment of the disease during its pre-invasive stages when 100.0% cure rate is possible with simple surgical procedures. Pap's smear is the gold standard in detection of very early cancer. It is relatively effective, simple and low cost test.

Cervical cancer starts invading from cervical transitional zone. In order to take appropriate sample from the transitional zone cells, health care provides need appropriate sampling device. ln a meta-analysis study, cytobrush in accompany with Ayre's spatula was reported to be the most effective pap's smear device which is effective in creating high-quality smears and detecting cervical dysplasia[5]. It has also been shown in previous studies that cytobrush- Ayre's spatula can be known as the best tool to detect pre-cancerous cells instead of using only Ayre's spatula. Another meta-analysis reported that using Ayre's spatula alone could not be a suitable method of sampling from endocervical cells. Most studies have reported that smears, which lack endocervical cells, are more likely to carry false negative results. Therefore in order to minimize the number of false negative results, the slides must contain enough endocervical cells[6]. In current study, 92% of smears obtained with cytobrush contained endocervical cells and 76% of smears taken with Ayre's spatula incorporated endocervical cells, which shows that the possibility of false negative results is less in sampling with cytob rush than that of Ayre's spatula[7]. In their study, Canon et al. compared the

results of two methods of sampling with either Ayre's spatula or cytobrush[8]. They stated that the rates of endocervical cells were 90.7% and 98.5% in either method, respectively. Since smears containing endocervical cells are more likely to determine early stages of cervical cancers, cytobrush provided more endocervical cells and was more valuable in preparing better sample[8]. In addition, the study conducted by Rammou-Kinia et al[9] demonstrated that the rate of endocervical cells in slides prepared with cytobrush were higher and false negative results were less. In another study, Noel explained that, in women with cervical stenosis, cytobrush was a suitable device in order to collect samples from endocervix[10].

Ever since the Pap's smear has been introduce in 1943, the increased detection of pre invasive cancer has been associated with a decrease in the incidence of invasive cancer and consequently in mortality from this disease. But due to socioeconomic condition this cannot be introduced in Bangladesh like most of the developing countries. In Bangladesh there is no ideal set up for providing preventive health care including screening facilities for genital cancer. In our country with limited resources and trained man limited facilities for performing cervical smear are present only at little institutional level. As this procedure has low cost, non- harmful and bears excellent specificity and acceptable sensitivity and simple method to perform this scheme can be successfully incorporated into work schedule of medical and para medical personnel. So, this screening procedure should be extensively advocated and emphasized by gynecologist, cytologist & paramedics as well as it should be incorporated into national health scheme. Cytobrush is an easy instrument to use & is well tolerated by patients. Another advantages of the cytobrush is its ability to collapse to 1mm, allowing it to pass into a stenotic cervical os. This may suggest its preferential use in postmenopausal women. So, use of the cytobrush is recommended in the interest of reducing the number of false negative results.

Conclusion

We find it fair to conclude that our study had enough strength, because, we used both methods of sampling in each participants; nevertheless, we are not to generalize the results of our study to a large population. Further studies with larger sample size, different participants, and random sampling are needed to make definite decision on the usage of this device as the most proper tools for Pap smear.

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Original Article

Journal of Monno Medical College,
December 2020, Vol. 6, No. 2, pp. 45-47

ISSN (Print) 2412-3277

Clinical Profiles and Type of Cervical Carcinoma among Women attended at a Tertiary Care Hospital

Chowdhury UWK[1], Akhter SNN[2], Afrose R[3], Bhuiyan MAS[4], Mowla MG[5]

Abstract

Background: Cervical cancer is the most common prevalent cancer that continues to be a major health care problem worldwide. It is still an important cause of mortality and morbidity in the developing countries. **Objective:** The primary object of the study was to find out the clinical features and histological findings of carcinoma cervix of the study population. **Methodology:** This cross sectional study was done in Gynaecology and Obstetric department in MMCH between October 2009 to March 2010 to see the clinical features and types of carcinoma cervix. **Results:** Out of total 50 diagnosed cases of cervical cancer were evaluated regarding their clinio-demographic profile, types of carcinoma cervix and treatment done. The results showed 22(44.0%) of patients were in the age group of 41 to 50 years, most common clinical features were blood stained foul smelling per vaginal discharge 41(82%) and most common types were squamus cell carcinoma 47(94%) cases. **Conclusion:** All women of reproductive age should be screened according to any complaints to evaluate carcinoma cervix, thus reduce the morbidity and mortality rate. *[Journal of Monno Medical College, December 2020;6(2): 45-47]*

Keywords: Cervix cancer; pervaginal bleeding; clinical profiles; cervical carcinoma

Received: : 7 June 2020; **Accepted:** 5 October 2020; **Published:** 1 December 2020

Introduction

Cervical cancer is a cancer arising from the cervix[1]. It is due to the abnormal growth of cells that have the ability to invade or spread to other parts of the body[2]. Cervical cancer is the most prevalent cancer that continues to be a major health care problem worldwide. It is still an important cause of mortality and morbidity in the developing countries. An estimated 47, 000 new cases of cervical cancer and 23,000 death occurred in the year 2000[3-4]. Incidence appears to change from one locality to another, however from various studies[3,5]. There is no doubt that it is the most common gynecological cancer in many developing countries. Worldwide, cervical cancer is both the fourth-most common cause of cancer and the fourth-most common cause of death from cancer in women[3].

According to the Bangladesh Bureau of Statistics; cancer is the sixth leading cause of death. International Agency for Research on Cancer has estimated cancer-related death rates in Bangladesh to be 7.5% in 2005 and 13.0% in 2030[6]. The two leading causes are in males are lung and oral cancer and in females are breast cancer and cervical cancer. Bangladesh is now in severe shortage of radiation therapy machines, hospital bed, trained oncologists, medical radiation physicists and technologists[6]. In Bangladesh no population based study is available regarding the prevalence. Prevalence of cervical cancer in developing countries is related to many risk factors as early marriage, early exposure of sexual activity, multiparity, low socioeconomic condition and high incidence of Sexually Transmitted Diseases and HPV infection[7]. Early

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Conflict of interest: We do not have any conflict of interest (financial or others).

How to cite this article: Chowdhury UWK, Akhter SNN, Afrose R, Bhuiyan MAS, Mowla MG. Clinical Profiles and Type of Cervical Carcinoma among Women attended at a Tertiary Care Hospital. J Monno Med Coll 2020;6(2): 45-47

on, typically no symptoms are seen. Later symptoms may include abnormal vaginal bleeding, foul smelling per vaginal discharge, pelvic pain, or pain during sexual intercourse[1]. While bleeding after sex may not be serious, it may also indicate the presence of cervical cancer[8].

The first episodes of bleeding commonly follow coitus, staining, at stool or any circumstances which exposes the cervix to trauma. The discharge is first creamy or white but subsequently resembles dirty brown water; it has a particularly offensive and characteristic odour. Cervical cancer typically develops from precancerous changes over 10 to 20 years[9]. About 90% of cervical cancer cases are squamous cell carcinomas, 10% are adenocarcinoma, and a small number are other types[10]. The primary object of the study was to find out the clinical features and histological findings of carcinoma cervix of the study population.

Methodology

It was a descriptive type cross sectional study. Sampling technique was non probability convenient type. The study was done in the Department of Obstetrics and Gynaecology in Mymensingh Medical College Hospital, Mymensingh, Bangladesh from October 2009 to March 2010 for a period of six months. The women suffering from carcinoma cervix were included in this present study. Carcinoma cervix with other gynaecological disorders and pregnancy with carcinoma cervix were excluded. All the patients were inquired for symptoms, clinical and pelvic examination was performed and histopathological report was done by pathology department MMCH. Data was collected in a data collection sheet and all data were collected in scrutinized for any error and SPSS program of computer was used.

Results

A total number of 50 women were recruited in this study after fulfilling the inclusion and exclusion criteria. Most common age was 41-50 years, which was 22(44%), all are married and maximum were below average socio-economic status (Table 1). Most common clinical presentation was blood stained foul smelling per vaginal discharge, it was 41(82%) cases (Table 2).

Table 1: General characteristic variable of the study subjects (n=50)

Characteristics	Frequency (%)
Age Group	
<30 years	0(0.0)
31-40 years	9(18.0)
41-50 years	22(44.0)
51-60 years	10(20.0)
>60 years	9(18.0)
Mean±SD	46.9±10.83
Marital status	
Married	43(86.0)
Unmarried	0(0.0)
Widow	7(14.0)
Socio-economic status	
Bellow average	43(86.0)
Average	7(14.0)
More than average	0(0.0)

Table 2: Different clinical presentation of study object (n=50)

Clinical presentation	Frequency (%)
Blood stained foul smelling per vaginal discharge	41(82.0)
Metrorrhagia	20(40.0)
Post coital bleeding	28(56.0)
Lower abdominal pain	20(40.0)
Post-menopausal bleeding	18(36.0)

Maximum patients were moderate type anaemic 41(82%) cases (Table 3).

Table 3: Anaemic status of the study subject (n=50)

Anaemia	Frequency (%)	P value
Mild	4(8.0)	<0.001
Moderate	41(82.0)	
Severe	05(10)	

Cauliflower type was more common 21(62%) cases (Table 4).

Table 4: Macroscopic Type of Cervical Carcinoma (n=50)

Type	Frequency (%)	P value
Ulcerative	16(32)	<0.001
Cauliflower	21(62)	
Fungating	02(04)	
Insignificant	01(02)	

Most common histologic type was squamous cell carcinoma 47 (94%).

Table 5: Histopathological type of study subject (n=50)

Type	Frequency (%)	P value
Squamous cell carcinoma	47(94)	<0.001
Adenocarcinoma	03(06)	
Others	00(00)	

Discussion

Cancer is predicted to be an increasingly important cause of morbidity and mortality in Bangladesh in the next few decades[6]. In the present study 41-50 years were the predominant population. This observation is similar to other stydies[11,12] but differ from study done by Parveen et al[13] and Shamsuddin et al[14], who reported more cases in early age

groups. The number of cases after the age of 60 years and above is less in this study as compared to other studies[15]. This difference may be due to short life expectancy in our country. From the comparison it appears that cervical cancer patients were more likely to be married and to have married at an earlier age, it was similar to our studies[16].

The commonest complaint in the study was blood stained foul smelling pervaginal discharge. While in a study by Shamsuddin et al[14] where the chief complaints was excessive vaginal discharge in 50.49% population. In another study by Hill and Galaante[17], the commonest complaints were irregular vaginal bleeding or blood stained discharge on coitus or staining. The difference may be due to late presentation of the patients in our set up when the cervical growth becomes infected leading to foul smelling bloody discharge. Anaemia is the common clinical feature in carcinoma, cervix it may be due to per vaginal bleeding for long time, anorexia, nausea of the patient[18].

The most frequent types of cervical cancer are squamous-cell carcinoma and adenocarcinoma, which develop from the distinctive precursor lesions cervical intraepithelial neoplasia (CIN) or squamous intraepithelial lesion (SIL), and adenocarcinoma in situ (AIS), respectively[19]. After per speculum examination most of the carcinoma seems cauliflower type, second most common was ulcerative type. Cervical biopsy of the study population shows 94.0% had squamous cell carcinoma of different grades and three patients had adenocarcinoma. No other histological types were found. This features were similar to other studies[20-22].

Conclusion

Most common clinical features in carcinoma cervix was blood stained foul smelling vaginal discharge. Common type was squamous cell carcinoma. The morbidity and mortality can be prevented by primary health care education, early diagnosis and adequate treatment.

Acknowledgement: We express our gratitude to Director, Mymensingh Medical College Hospital, for his kind cooperation to carry out study. We also thanks to all patients for their unvoiced help and all staffs of Obstetrics and Gynaecology Dept. in MMCH for their cordial cooperation during this research period.

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Original Article

Journal of Monno Medical College,
December 2020, Vol. 6, No. 2, pp. 48-51

ISSN (Print) 2412-3277

Comparison of Serum Magnesium Level among Type 2 Diabetic and Non-Diabetic Patients

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Abstract

Background: Type 2 diabetes mellitus is associated with derangement of electrolytes in blood. **Objective:** The purpose of the present study was to compare the serum magnesium level in type 2 diabetic and non-diabetic patients. **Methodology:** This cross-sectional study was carried out in the Department of Medicine at Shaheed Suhrawardy Medical College Hospital (ShSMCH), Dhaka, Bangladesh from July 2012 to December 2012 for a period of six (06) months. All the type 2 diabetic patients admitted in the Department of Medicine in-patient department of ShSMCH who were 18 years and above age with both sexes were included as study population and were designated as group A; however, non-diabetic patients in 18 years and above age with both sexes were included as group B. Blood samples were drawn after an overnight fast for the measurement of fasting blood sugar and serum magnesium. **Result:** In this present study a total number of 60 patients were enrolled for this study after fulfilling the inclusion and exclusion criteria of which 30 patients were in group A and the rest 30 patients were in group B. More than 1.7 mg/dL of serum magnesium was found in 17(38.6%) and 27(61.4%) patients in group A and group B respectively (p=0.004). More than 6.1 of FBS was found in 13(81.2%) patients and 16(36.4%) cases in less than 1.7 and more than 1.7 mg/mL of serum magnesium respectively (p=0.002). Less than 1.7 mg/dL serum magnesium was found in 3(10.0%) patients and 13(43.3%) cases in less than 6.5% and more than 6.5% of HbA1C respectively (p=0.004). **Conclusion:** Type 2 diabetes mellitus is associated with low serum magnesium. *[Journal of Monno Medical College, December 2020;6(2): 48-51]*

Keywords: : Comparison; serum magnesium level; type 2 diabetic; non-diabetic patients

Received: : 7 June 2020; **Accepted:** 5 October 2020; **Published:** 1 December 2020

Introduction

Type 2 diabetes accounts for approximately 90 to 95% of all diagnosed cases of diabetes[1]. In addition to acute emergencies like hyperosmolar coma and ketoacidosis, patients with type-2 diabetes may have cardiovascular disease, nephropathy, retinopathy, polyneuropathy and other chronic complications[2]. With its associated complications, diabetes was reported to be the sixth leading cause of death listed on US death certificates[3]. Thus, the treatment of the patients with diabetes requires a multidisciplinary approach whereby every potential complicating factor must be monitored closely and treated accordingly[4].

Hypomagnesaemia has been reported to occur in 13.5 to 47.7% of non-hospitalized patients with type-2 diabetes compared with 2.5 to 15% among their counterparts without diabetes[5]. The wide range in the reported incidence of hypomagnesaemia most likely reflects the difference in the definition of hypomagnesaemia, techniques in Mg measurements, and the heterogeneity of the selected patient cohort[1]. In terms of gender difference, it is interesting to note that independent studies have reported a higher incidence of hypomagnesaemia in women compared with men, at a 2-to-1 ratio[6]. In addition, men with diabetes may have higher ionized levels of magnesium[7].

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Conflict of interest: We do not have any conflict of interest (financial or others).

How to cite this article: Hasan KAMM, Fatema N, Bhuiyan AKMM, Islam DMK, Khandaker MNR. Comparison of Serum Magnesium Level among Type 2 Diabetic and Non-Diabetic Patients. J Monno Med Coll 2020;6(2): 48-51

Hypomagnesaemia has been associated with type 2 diabetes; however, it has been reported an inverse relationship between glycemic control and serum Mg levels[8]. It has been reported that diabetes may induce hypomagnesaemia[9]; however, higher Mg intake may confer a lower risk for type 2 diabetes[10]. It is interesting that the induction of Mg deficiency has been shown to reduce insulin sensitivity in individuals without diabetes, whereas Mg supplementation during a 4-wk period has been shown to improve glucose handling in elderly individuals without diabetes[11]. Therefore, the purpose of the present study was to see the pattern of serum magnesium level among the type 2 diabetic and non-diabetic patients.

Methodology

This comparative cross-sectional study was carried out in the Department of Medicine, Shaheed Suhrawardy Medical College Hospital, Dhaka, Bangladesh from July 2012 to December 2012 for a period of six (06) months. All the type 2 diabetic patients admitted in the Department of Medicine in-patient department of ShSMCH who were 18 years and above age with both sexes were included as study population and were designated as group A; however, non-diabetic patients in 18 years and above age with both sexes were included as group B. The selected study population were recruited after fulfilling the inclusion and exclusion criteria. Blood samples were drawn after an overnight fast for the measurement of fasting blood sugar, HbA1C and serum magnesium. Data were collected by face-to-face interview by the researcher himself and were recorded in a predesigned structured questionnaire. Prior to the commencement of the study written consent were taken from every study participant and the research protocol was approved by the ethical committee (Local Ethical committee) of ShSMCH. After enrolment data on clinical history, clinical features, socio-economic characteristics were collected from all the study participants. Blood sample were collected from every patient and the samples were sent to the department of Biochemistry of National Institute of Cardiovascular Diseases (NICVD), Dhaka for the measurement of serum magnesium, HbA1c, fasting blood glucose, 2 hours after breakfast. This was performed in Biochemical Auto analyser Machine (Siemens, Germany). Computer based statistical analysis were carried out with appropriate techniques and systems. All data were recorded systematically in preformed data collection form (questionnaire) and quantitative data were expressed as mean and standard deviation and qualitative data were expressed as frequency distribution and percentage. Statistical analysis was performed by using windows-based computer software devised with Statistical Packages for Social Sciences (SPSS 22.0) (SPSS Inc, Chicago, IL, USA). 95% confidence limit was taken. Probability value <0.05 was considered as level of significance. The association between qualitative variables was measured by Chi-Square test. Student's t test had been performed to see the association between quantitative variables. The summarized data was interpreted accordingly and was then presented in the form of tables.

Results

A total number of 60 patients were enrolled for this study after fulfilling the inclusion and exclusion criteria of which 30 patients were in group A and the rest 30 patients were in group B. In less than 45-year age group majority were in non-diabetic group which was 10 (52.6%) and 9 (47.4%) patients respectively. In the age group of 45-to-55-year majority were in diabetic group which was 8 (53.3%) and 7 (46.7%) patients respectively. In the age group of 55-to-65-year majority were in non-diabetic group which was 8 (53.3%) and 7 (46.7%) patients respectively. In more than 65-year age group majority were in diabetic group which was 6 (54.5%) and 5 (45.5%) respectively (Table 1).

Table 1: Distribution of Study Population according to Age group (n=60)

Age Group	Group		Total	P value
	Diabetic	Non-diabetic		
Less Than 45 Years	9(47.4%)	10(52.6%)	19(100.0%)	
45 to 55 Years	8(53.3%)	7(46.7%)	15(100.0%)	0.964*
55 to 65 Years	7(46.7%)	8(53.3%)	15(100.0%)	
More Than 65 Years	6(54.5%)	5(45.5%)	11(100.0%)	
Total	**30(50.0%)**	**30(50.0%)**	**60(100.0%)**	0.652**
Mean±SD	54.67±10.89	53.27±12.94		

*Pearson Chi-Square test was performed to see the level of significance;
**Student t test was performed to see the level of significance.

The distribution of serum magnesium among the study population was recorded. Less than 1.7 mg/dL of serum magnesium was found in 13 (81.2%) and 3 (18.8%) patients in diabetic and non-diabetic respectively. More than 1.7 mg/dL of serum magnesium was found in 17(38.6%) cases and 27(61.4%) cases in diabetic and non-diabetic patients respectively. The association was statistically significant (p=0.004). The mean serum magnesium with SD were 1.810±0.3231 and 2.163±0.2526 in diabetic and non-diabetic respectively (p=0.0001) (Table 2).

Table 2: Distribution of Serum Magnesium among the Study Population (n=60)

Serum Magnesium	Group		Total	P value
	Diabetic	Non-diabetic		
Less Than 1.7	13(81.2%)	3(18.8%)	16(100.0%)	
More Than 1.7	17(38.6%)	27(61.4%)	44(100.0%)	0.004
Total	30(50.0%)	30(50.0%)	60(100.0%)	
Mean±SD	1.810±0.3231	2.163±0.2526		0.0001

*Pearson Chi-Square test was performed to see the level of significance;
** Student t test was performed to see the level of significance.

The association between fasting blood sugar level and serum magnesium was recorded. More than 6.1 of FBS was found in 13 (81.2%) patients and 16 (36.4%) cases in Less Than 1.7 and More Than 1.7 mg/mL of serum magnesium respectively. Less than 6.1 of FBS was found in 3 (18.8%) patients and 28 (63.6%) cases in less than 1.7 and more than 1.7 mg/mL of serum magnesium respectively. The association was statistically significant (p=0.002) (Table 3).

Table 3: Association between Fasting Blood Sugar Level and Serum Magnesium

Serum Magnesium (mg/dL)	FBS (mmol/L)		Total	P value
	Less Than 6.1	More Than 6.1		
Less Than 1.7	3(18.8%)	13(81.2%)	16(100.0%)	
More Than 1.7	28(63.6%)	16(36.4%)	44(100.0%)	0.002
Total	**31(51.7%)**	**29(48.3%)**	**60(100.0%)**	

Considering the association between HBA1C level and serum magnesium level, more than 1.7 mg/dL serum magnesium was found in 27 (90.0%) patients and 17 (56.7%) patients in less than 6.5% HbA1C and more than 6.5% of HbA1C respectively. Less than 1.7 mg/dL serum magnesium was found in 3 (10.0%) patients and 13 (43.3%) patients in less than 6.5% and more than 6.5% of HbA1C respectively. The association was statistically significant (p=0.004) (Table 4).

Table 4: Association between HBA1C Level and Serum Magnesium

HbA1C (%)	FBS (mmol/L)		Total	P value
	Less Than 1.7	More Than 1.7		
Less Than 6.5	3(10.0%)	27(90.0%)	30(100.0%)	
More Than 6.5	13(43.3%)	17(56.7%)	30(100.0%)	0.004
Total	**16(26.7%)**	**44(73.3%)**	**60(100.0%)**	

Discussion

Diabetes mellitus (DM) is characterized by metabolic disorders related to high levels of serum glucose. It is probably the most associated disease to Mg depletion in intra and extra cellular compartments[12]. Hypomagnesemia has been related as a cause of insulin resistance, also being a consequence of hyperglycaemia, and when it is chronic leads to the installation of macro and microvascular complications of diabetes, worsening the deficiency of magnesium[13].

In this present study a total number of 60 patients were enrolled for this study after fulfilling the inclusion and exclusion criteria of which 30 patients were in group A and the rest 30 patients were in group B. The distribution of study population according to age group was recorded. In less than 45-year age group majority were in non-diabetic group which was 10 (52.6%) and 9 (47.4%) patients respectively. In the age group of 45-to-55-year majority were in diabetic group which was 8 (53.3%) and 7 (46.7%) patients respectively. In the age group of 55-to-65-year majority were in non-diabetic group which was 8 (53.3%) and 7 (46.7%) patients respectively. In more than 65-year age group majority were in diabetic group which was 6 (54.5%) and 5 (45.5%) respectively. Middle age patients are more predominant. Type 2 diabetes mellitus is commonly diagnosed in this age group. Similar to the present study result Sales et al[14] have reported that middle age group are commonly affected by type 2 diabetes mellitus.

The distribution of serum magnesium among the study population was recorded. Less than 1.7 mg/dL of serum magnesium was found in 13 (81.2%) and 3 (18.8%) patients in diabetic and non-diabetic respectively. More than 1.7 mg/dL of serum magnesium was found in 17 (38.6%) and 27 (61.4%) patients in diabetic and non-diabetic respectively. The association was statistically significant (p=0.004). The mean serum magnesium with SD were 1.810±0.3231 and 2.163±0.2526 in diabetic and non-diabetic group respectively (p=0.0001). Similar report has been published by Barbagallo et al[15] and have been explained that the mechanisms whereby hypomagnesemia may induce or worsen existing diabetes are not well yet understood. Nonetheless, it has been suggested that hypomagnesemia may induce altered cellular glucose transport, reduced pancreatic insulin secretion, defective post-receptor insulin signalling, and/or altered insulin-insulin receptor interactions[16]. Not all studies, however, observed a correlation between glycaemic control and serum Mg levels or improvement of diabetic control with Mg replacement[17].

The association between fasting blood sugar level and serum magnesium was recorded. More than 6.1 of FBS was found in 13 (81.2%) patients and 16 (36.4%) cases in less Than 1.7 and more Than 1.7 mg/mL of serum magnesium respectively. Less than 6.1 of FBS was found in 3 (18.8%) patients and 28 (63.6%) cases in less than 1.7 and more than 1.7 mg/mL of serum magnesium respectively. The association was statistically significant (p=0.002). The association between HbA1C level and serum magnesium was recorded. Normal level of serum magnesium was found in 27 (90.0%) patients and 17 (56.7%) patients in less than 6.5% and More Than 6.5% of HbA1C respectively. Hypomagnesemia was found in 3 (10.0%) patients and 13 (43.3%) patients in less than 6.5% and more than 6.5% of HbA1C respectively. The association was statistically significant (p=0.004). Significant association was reported by Pham et al1 and have mentioned that not only has hypomagnesemia been associated with type 2 diabetes, but also numerous studies have reported an inverse relationship between glycaemic control and serum Mg levels[4]. Although many authors have suggested that diabetes may induce hypomagnesemia, others have reported that higher Mg intake may confer a lower risk for type 2 diabetes[17]. It is interesting that the induction of Mg deficiency has been shown to reduce insulin sensitivity in individuals without diabetes, whereas Mg supplementation during a 4-wk

period has been shown to improve glucose handling in elderly individuals without diabetes[13,16].

Conclusion

In conclusion serum magnesium level is significantly different in type 2 diabetic and non-diabetic patients. Furthermore, the fasting blood sugar level, the HbA1C level are significantly associated with the serum magnesium level. Further large-scale study should be carried out to get the real scenario.

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Review Article

Journal of Monno Medical College,
December 2020, Vol. 6, No. 2, pp. 52-55

ISSN (Print) 2412-3277

COVID-19 Pandemic as Global Health Problem and Bangladesh Situation: A Review

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Abstract

The outbreak of novel coronavirus, severe acute respiratory syndrome coronavirus (SARS-CoV-2), first reported in Wuhan, China that contributed to an increased morbidity and mortality, was declared to be a major worldwide pandemic by the World Health Organization. Since then, recent advances in understanding the pathological progression and transmission of coronavirus disease (CoVID-19) have contributed to efforts toward the development of pharmacological and non-pharmacological strategies. The COVID-19 pandemic in Bangladesh is part of the worldwide pandemic of coronavirus disease 2019 (COVID-19). Bangladesh, a lower-middle-income country and one of the world's most densely populated areas. Therefore social distancing is tough while taking public commutes and living in the slums and enforcement of social distancing is, practically impossible in this country. Causes, virology, pathophysiology, transmission, incubation period, clinical manifestations, diagnosis, prevention and management of COVID-19 have been discussed in this review. Preparedness is the key to addressing any health crisis, and so far, Bangladesh, as a lower-middle-income country, has numerous limitations in restricting the spread of the virus. It has to ensure a constant supply of PPE for healthcare workers. The Government will not be able to mitigate the situation alone individual efforts from the citizens, direct involvement of the nation's public health experts, and international help are urgently needed. *[Journal of Monno Medical College, December 2020;6(2): 52-55]*

Keywords: Coronavirus; pandemic; Bangladesh situation; pathophysiology; clinical features; diagnosis; prevention

Received: : 1 November 2020; **Accepted:** 15 November 2020; **Published:** 1 December 2020

Introduction

Novel Coronavirus disease 2019 (COVID-19) is a respiratory tract infectious disease that is caused by a Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), provisionally called the 2019 novel coronavirus (2019-nCoV). COVID-19 is a newly identified pathogen and thus termed as a novel coronavirus disease[1]. COVID-19 causes Severe Acute Respiratory Syndrome (SARS) and was declared a global pandemic by the World Health Organization on 11th March 2020[2]. COVID-19 was first reported on 31st December 2019 in Wuhan, China, and was initially referred to as pneumonia of unknown etiology[3].

Global Situation

With the outbreak of novel coronavirus-2 (nCoV-2) declared a pandemic and an international public health emergency by the World Health Organization (WHO), the entire world is working to address it. It is a rapidly evolving and emerging situation. As of 09:23 UTC on 9th October 2020, a total of 36,542,723 cases are confirmed in more than 227 countries and territories, and 26 cruise and naval ships[4]. There are 10,003,011 active cases and 1,062,360 deaths[4].

Bangladesh situation

Bangladesh, a lower-middle-income country and one of the

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Conflict of interest: We do not have any conflict of interest (financial or others).

How to cite this article: Alam MJ, Mahjabin A, Ali KM, Tamjid JM, Tarannum T. COVID-19 Pandemic as Global Health Problem and Bangladesh Situation: A Review. J Monno Med Coll 2020;6(2): 52-55

world's most densely populated areas, is struggling to combat the spread of the disease. The virus was confirmed to have spread to Bangladesh in March 2020. The first three known cases were reported on 8 March 2020 by the country's epidemiology institute, IEDCR. Since then, the pandemic has spread day by day over the whole nation and the number of affected people has been increasing in order to protect the population, the government declared "lockdown" throughout the nation from 23 March to 30 May and prepared some necessary steps to spread awareness to keep this syndrome away from them[5]. Infections remained low until the end of March but saw a steep rise in April[6].

On March 15, the country banned all flights coming from Europe except the United Kingdom; however, the authority still allowed flights from Europe to land in an airport[7]. As a result, over 631 thousand people entered the country in just 55 days from January 21[8]. Although the Institute of Epidemiology, Disease Control and Research (IEDCR) claimed that it tested every single person who entered the country, there has been intense criticism of the testing facilities in the ports of entry[9,10]. Beginning on March 16, the country imposed a 14-day obligatory quarantine to all travelers who entered the country[11]. It attempted to bring travelers coming from Italy-which was then declared a new epicenter of the pandemic- to a quarantine site. The move was sharply criticized due to a lack of arrangements, and the travelers were allowed to enter the country by themselves on the condition of 14- day-long self-isolation. Since then, hundreds of expatriates who came from COVID-19-affected countries have been seen out in the streets and gatherings-traveling to tourist sites, meeting with friends and families[12]. On March 19, the country deployed the army to supervise two quarantine facilities in Dhaka[13]. From the first week of March, Bangladesh started to postpone all mass gatherings, including the 100th-anniversary celebration event of the birth of its founder, Sheik Mujibur Rahman, as a preventive measure against the spread of nCoV-2[14]. Despite these measures, tens of thousands of people gathered in a special prayer session for protection against nCoV-2 in Lakshmipur, despite not having the local Government's permission. Afterward, the Government banned all political, social, cultural, and religious rallies and gatherings in the country[15]. Amid this crisis, the country witnessed voting in three constituencies, where people had to go to the voting centers in person to cast their votes. Meanwhile, the health ministry said that nCoV-2 has spread to the community transmission level[16].

As reported by Directorate General Health Services on 20th October, 2020, a total of 3,91,586 cases are confirmed, total deaths 5,699 and total recovery 3,07,141 in Bangladesh[17]. However, concerns have been raised that extreme insufficiency of testing assays may be leaving many cases undetected in the country. Bangladesh did not impose any strict protocol initially, and millions of people were out on the streets, especially in Dhaka, which is a megacity with 46 thousand people living per square kilometer[18]. It appears that social distancing is tough while taking public commutes and living in the slums. In the context of massively populated and lower-middle-income countries like Bangladesh, enforcement of social distancing- as recommended by the WHO to stop the nCoV-2 spread- sounds fancy but impractical. Indeed, staying at home is unlikely to be as effective here. Immediate enforcement of social distancing is, in every way, practically impossible in a country like Bangladesh.

Cause

COVID-19 is caused by infection with the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus strain.

Virology

It was first isolated from three people with pneumonia connected to the cluster of acute respiratory illness cases in Wuhan[19]. All features of the novel SARS-CoV-2 virus occur in related coronaviruses in nature[20]. Outside the human body, the virus is destroyed by household soap, which bursts its protective bubble[21]. SARS-CoV-2 is closely related to the original SARS-CoV[22]. It is thought to have an animal (zoonotic) origin. Genetic analysis has revealed that the coronavirus genetically clusters with the genus Betacoronavirus, in subgenus Sarbecovirus (lineage B) together with two bat-derived strains. It is 96% identical at the whole genome level to other bat coronavirus samples (BatCov RaTG13)[23,24].

Pathophysiology

COVID-19 can affect the upper respiratory tract (sinuses, nose, and throat) and the lower respiratory tract (windpipe and lungs)[25]. The lungs are the organs most affected by COVID-19 because the virus accesses host cells via the enzyme angiotensin-converting enzyme 2 (ACE2), which is most abundant in type II alveolar cells of the lungs[26]. The virus also affects gastrointestinal organs as ACE2 is abundantly expressed in the glandular cells of gastric, duodenal and rectal epithelium[27] as well as endothelial cells and enterocytes of the small intestine[28]. The virus can cause acute myocardial injury and chronic damage to the cardiovascular system[29]. A high incidence of thrombosis and venous thromboembolism have been found in ICU patients with COVID-19 infections, and may be related to poor prognosis[30].

Transmission

The modes of spread of COVID 19, a new disease caused by the SARS-CoV-2 virus, are under research and investigation. It spreads from person to person, via several different modes, mainly when people are in close proximity to one another through respiratory droplets[31,32]. It can transmit when people are symptomatic, also for up to two days prior to developing symptoms, and even if a person never shows symptoms. People remain infectious in moderate cases for 7-12 days, and up to two weeks in severe cases[33].

Incubation Period

Incubation period is the time between exposure to an infectious agent and the appearance of clinical symptoms or physiological evidence of disease. It is not known if transmission of the virus occurs during this period and before the presence of clinical symptoms. The WHO estimates of the incubation period for COVID-19 range from 1 to 14 days, most commonly around 5 days. Modeling of the role of contact tracing and case isolation suggest that these are effective in the control of epidemics such as COVID-19[34]. If transmission is occurring before symptoms appear, it makes it more difficult to control an infectious disease.

Clinical Manifestations

Symptoms of COVID-19 can be relatively non-specific; the two most common symptoms are fever (88 percent) and dry cough (68.0%). Less common symptoms include fatigue, respiratory sputum production (phlegm), loss of the sense of smell, loss of taste, shortness of breath, muscle and joint pain, sore throat, headache, chills, vomiting, coughing out blood, diarrhea, and rash[35-37]. Among those who develop symptoms, approximately one in five may become more seriously ill and have difficulty breathing[38]. Emergency symptoms include difficulty breathing, persistent chest pain or pressure, sudden confusion, difficulty walking, and bluish face or lips; immediate medical attention is advised if these symptoms are present[37]. Further development of the disease can lead to complications including pneumonia, acute respiratory distress syndrome, sepsis, septic shock, and kidney failure[36].

Laboratory Diagnosis

The standard method of testing is real-time reverse transcription polymerase chain reaction (rRT-PCR)[39]. The test is typically done on respiratory samples obtained by a nasopharyngeal swab; however, a nasal swab or sputum sample may also be used[40,41].

Management

People are managed with supportive care, which may include fluid therapy, oxygen support, and supporting other affected vital organs.

Prevention

Preventive measures to reduce the chances of infection include staying at home, wearing a mask in public, avoiding crowded places, keeping distance from others, washing hands with soap and water often and for at least 20 seconds, practicing good respiratory hygiene, and avoiding touching the eyes, nose, or mouth with unwashed hands[42].

Conclusion

The immune response by humans to CoV-2 virus occurs as a combination of the cell-mediated immunity and antibody production[43], with the hope several countries are trying to invent effective vaccines. We can fight with this pandemic by the triad, using masks, social distancing 3-6 ft & washing hands.

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Case Report

Journal of Monno Medical College,
December 2020, Vol. 6, No. 2, pp. 56-60

ISSN (Print) 2412-3277

Surgical Correction of Sequels Involving Orbito-Zygomatic Fractures: A Case Report

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Abstract
The treatment of the sequels involving the orbito-zygomatic complex is a challenging problem in the oral and maxillofacial surgery. The surgical correction involves the reestablishment of the zygomatic contour with the adjacent bones and the normal functional, restoration of ocular globe. With this purpose several techniques and materials can be used, among them one biomaterial-titanium mesh and plate was used here. The aim of the present paper is to present a surgical treatment of zygomatico-orbital fracture sequel using titanium mesh and plate, to improve the repositioning of ocular globe and bone edges. Moreover, discussions on the handling of fractures sequels involving zygomatico-orbital complex will be argued under the form of literature revision. *[Journal of Monno Medical College, December 2020;6(2): 56-60]*

Keywords: Zygomatico-orbital fractures; surgical correction; biomaterial

Received: : 7 June 2020; **Accepted:** 20 October 2020; **Published:** 1 December 2020

Introduction

The fractures involving the orbito-zygomatic complex are sufficiently common and the literature reports a high occurrence of it[1]. Significant complications can occur as consequence of an absence or inadequate therapy, including facial asymmetry, enophthalmos, persistent diplopia, vertical dystopia,restriction of ocular movements and sensorial deficit involving infra-orbital nerve[2]. The main causes of these complications happen due to an inadequate reduction of fracture fragments and to a loss of ocular globe support, which cause alterations in the relation content-container of the ocular globe and its bony compartment. The treatment of zygomatico-maxillary complex sequels aims to repair the bone continuity in the orbital floor, the contour of zygomatico-frontal suture and the zygomatic arch, the alignment of the zygomatico-maxillary pillar and the internal portion of orbital bone walls.

The present paper aims to report a surgical treatment of zygomatico-orbital fracture sequel using titanium mesh and plate to obtain a correct repositioning of ocular globe and infraorbital margin in addition to proportion an adequate bone contour in the region of fronto-zygomaticand zygoamtico-maxillary suture, resetting the morpho-functional integrity of involved facial structures.

Case Presentation

Having suffered a car accident three days before, a thirty eight-old male patient came to our Department of Oral and Maxillofacial Surgery of Dhaka Dental College Hospital, November, 2017 with a history of trauma in the zygomatico-orbital area. Immediately after the accident, the patient received first-aid treatment only.

Through the clinical examination, we identified facial asymmetry and mild enophthalmos on the left side, as well as vertical dystopia and injuries both in the fronto-zygomatic suture and in the infraorbital rim. The outcome of the palpation was an irregularity in the fronto-zygomatic suture

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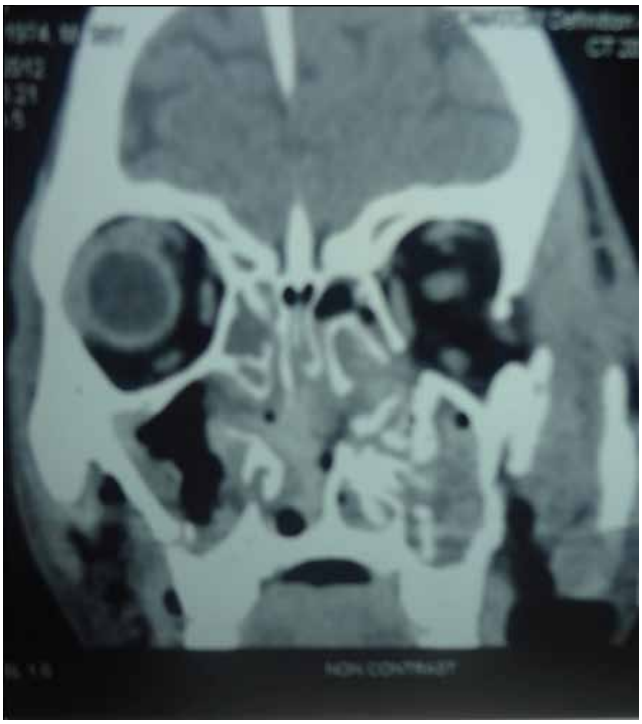
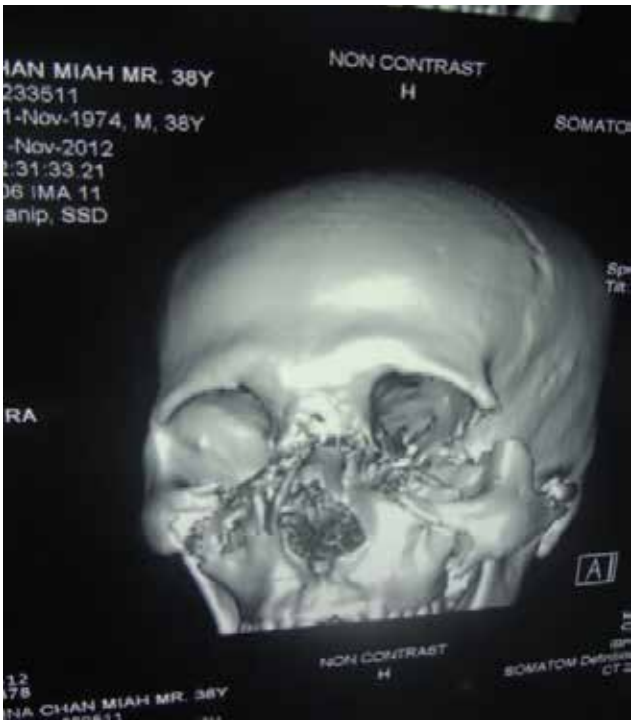
Conflict of interest: We do not have any conflict of interest (financial or others).
How to cite this article: Rahman KL, Haider IA, Rasul MG, Saquib AKMN, Rashid R. Surgical Correction of Sequels Involving Orbito-Zygomatic Fractures: A Case Report. J Monno Med Coll 2020;6(2): 56-60



Picture-I: The computed tomography shows medial rotation in the left fronto- zygomatic, zygomatico-maxillary and zygomatico- temporal sutures.



Picture-II: The computed tomography with three dimensional reconstruction shows medial rotation in the zygomatico-orbital area

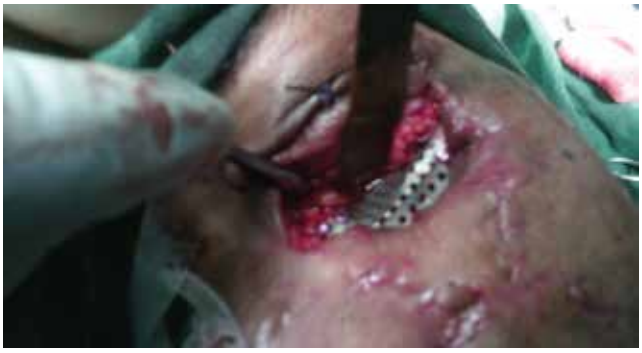


Figure III: Titanium mesh fixed with screws in the left infra orbital rim

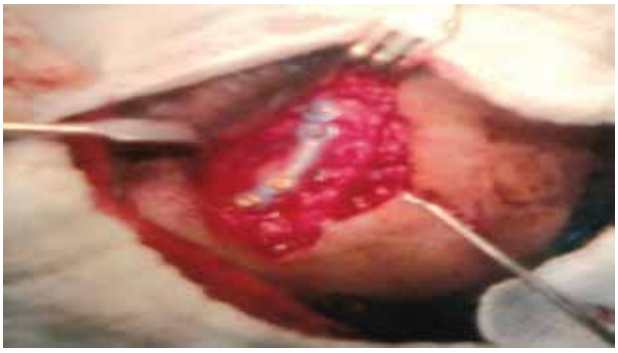


Figure IV: Titanium Plate fixed in the left fronto-zygomatic suture

and in the left infra-orbital margin. In addition, the intraoral examination confirmed the unevenness in the zygomatico-maxillary area. Although the patient reported feeling paresthesia in the left infraorbital margin, he did not complain about diplopia. The computed tomography showed in the zygomatic bone is separated with medial rotation in the left fronto-zygomatic, zygomatico-maxillary and zygomatico-temporal sutures. Furthermore, a dislocation of the lateral wall in relation to the medial wall was found in the maxillary area, with volume decrease. As for the eyeball, its diameter had increasedvertically. Finally, by means of axial sections themedial dislocation in the spheno-zygomatic suture was observed (Figure I, II). Based upon these findings, we reached a diagnosis of complete dislocation of the zygomatic bone (medial direction) associated with increase in the eyeball volume.

The suggested surgical technique consisted of titanium mesh and plate in the orbital floor and margin. As for the fronto-zygomatic suture, we decided to use the titanium plate. The orbital floor was reconstructed by titanium mesh and fixed by three titanium screws. The new contour of the infraorbital margin was reestablished by adjusting the titanium plate to the zygomatico-maxillary body, in order to simulate the infraorbital border. The titanium plate was affixed with three 5 mm long screws (Figure III). Aiming at fixing the other bone defect, located in the fronto-zygomatic suture, we inserted another four screws, and juxtaposed to the site wherethe bone had been fractured, in order to reestablish the orbital lateral projection (Figure IV).

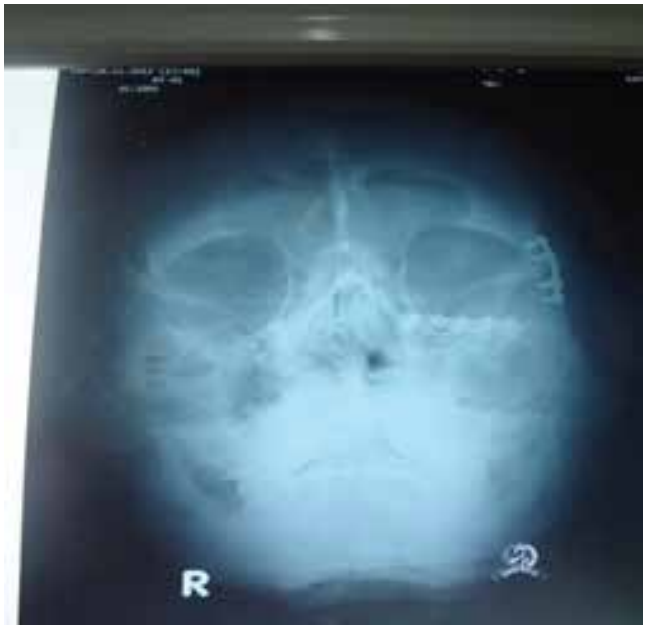


Figure V: Follow up by PNS imaging exams (OM view)

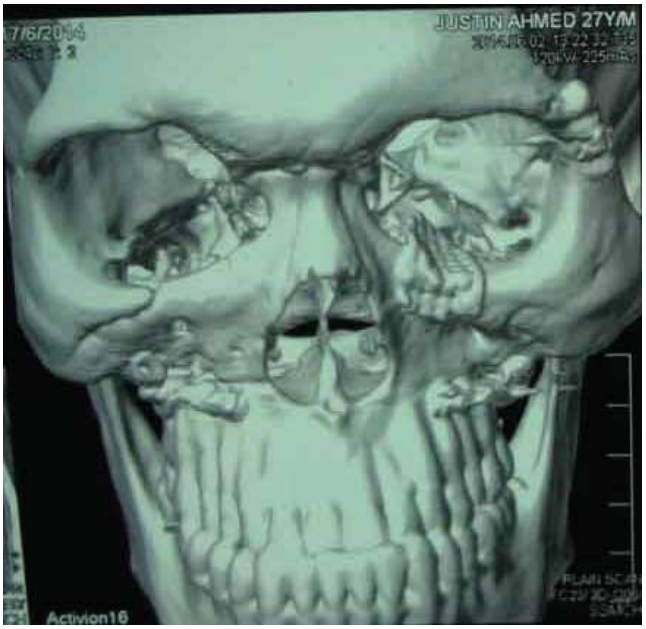


Figure VI: Post-operative 9 months follow-up by CT scan with 3D image showing reconstruction of the orbital floor and margin

The patient is undergoing follow-up sessions which consist of clinical and imaging examinations, in which we can clearly see the improvement in the projection of the eye ball, the decrease of the enophthalmos, the better infraorbital margin as well as the excellent recontour of the fronto-zygomatic suture (Figure V & VI).

Figure VII: Pre-operative facial profile

Figure VIII: 9 months post-operative photograph

Figure IX: 18 months post-operative facial profile

Discussion

Zygomatico-orbital fracture sequels may derive directly from the absence or inadequate reduction of the fractures, as well as from bone instability due to the inappropriate choice of the site and number of screws for stabilizing the bone. In order to deal with the traumatic sequels of the zygomatico-orbital complex, it is mandatory that a complete assessment of the patient be made. For establishing an objective plan of treatment,various factors must be determined and analyzed,such as the level of bone dislocation, the integrity of the orbital walls, the position of the eyeball, thevolume of the orbital content, the changes in the insertions of the canthal ligament, the periorbital soft tissues, the radiographic examination and the ophthalmologic evaluation[3]. In the present case, the combination of all these data has provided the precise information about the level and extension of the dislocation of the zygomatic bone, the volume of the orbital cavity and the conditions of the orbital floor.

The treatment of the zygomatico- orbital sequels involves surgical modalities repositioning of the bone and employment of titanium mesh and plate. The time period between the injury and the treatment plays an essential role in the selection of the best surgical procedure to be adopted. From 21 days to 4 months, Carr and Mathog[4] recommend performing osteotomies on the lines of the fracture in order to reposition of the zygomatic bone. Cohenand Kawamoto Jr.[5] describe a technique for correcting late enophthalmos and facial asymmetry by using an oscillating saw to recreate fracture lines,and then reposition the zygomatic bone in an overcorrected way.

The use of bone grafts is frequently required in late traumatic reconstructions[6]. Due to the longtime period between fracture and surgery, a process of remodeling and reabsorption of the juxtaposed, fractured bone margins and of the smashed fragments takes place. As a result, the identification of the exact site of the fracture lines, the anatomic repositioning of the segments and the bone stabilization may be difficult to be achieved[3]. After 4 months of untreated fracture, the most adequate therapeutic conduct for surgical correction, according to Carr and Mathog[4], excluding the processes of osteotomy and bone repositioning, aiming at reestablishing adequate bone contours and eyeball leveling.

In the present case, we chose titanium plate to reestablish the contour in the fronto-zygomatic and maxillary-zygomatic areas. For a better stabilization and support of the eyeball in the orbital floor area, the association of titanium mesh was employed. In the infraorbital margin area, due to the absence of projection, the plaque was modeled in such a way to simulate that anatomic area. Craniofacial bone defects may be repaired by using different techniques and implant materials. The choice of the implant material will depend upon the size and shape of the defect to be repaired, in addition to the conditions of the area that will receive it.

Disadvantage of autogenous bone graft mentioned in the literature, is the unpredictability of the reabsorption level of the graft[7]. Therefore, one important aspect to diminish the reabsorption level of the bone graft is its binding to the receptive area, since micromovements made by the ocular muscles conduct to a greater resorption of the graft.

For this reason, we use titanium mesh on the orbital floor. Studying the long term outcomes of craniofacial reconstruction using titanium mesh, Kuttenberger and Hardt[9] have demonstrated that the tridimensional reconstruction capacity produced by such procedure guarantees long term, functional and aesthetic stability, making it an alternative to bone and cartilaginous graft.

The excellent biocompatibility and easy handling of the titanium mesh have allowed us to reestablish, in a rather faithful way, the infraorbital and orbital floor areas of the patient whose case is described here, which matched perfectly with the titanium mesh. Moreover, the titanium mesh worked as a support structure for the orbital floor, which takes us back to what Hammer and Prein[10], Kuttenberger and Hardt9 and Oliveiera[6] have stated.

Conclusion

By carefully analyzing the treatment of the sequels produced by fractures in the zygomatico-orbitalcomplex, we may conclude that Detailed clinical and imaging examination must be carried out in order to establish the level of dislocation of the fracture and the extension of the orbital floor fragmentation, aiming at determining the necessary correction for the reestablishment, adequate bone recontour and at the enophthalmos correction. Fractures are better

corrected through titanium plate and mesh in the fronto-zygomatic sutureand zygomatico-maxillary areas, as well as in the infraorbital margin and orbital floor. The association of titanium mesh adds the strength, adaptation and support of the orbital floor.

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